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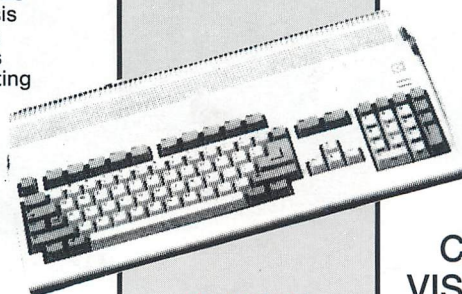
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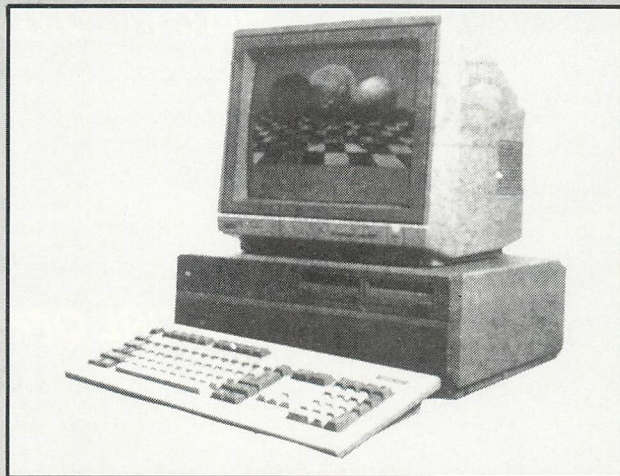
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THE AMIGA DIMENSION

You can't keep Commodore secrets... This month two "secret" AMIGA projects emerged. One was announced at the recent Developers' Conference in Paris. (Can you "announce" a secret?) You certainly must if you want software companies to work with your hardware. But the non-disclosure of information agreements they sign last about as far as the airport.

It wasn't much of a secret really, the unveiling of the range of UNIX-based Amigas *AUI* reported two years ago which are now to be launched at the Cebit Computer Show in Germany later this month. Commodore is finally getting together a whole family of high-end UNIX A3500 Amigas costing upwards of £4000.

UNIX, as regular readers will know, is the leader for the operating system crown of the Nineties. Clearly Commodore is betting its high-end Amiga stake on persuading the business world that the Amiga will be a feasible alternative to other manufacturers currently with more commercial credibility. It has already appointed a Top Business sales group in North America and a high-powered marketing outfit in Europe.

Mainline business cares only for fast, reliable, financially advantageous computers. Graphics? They're merely presentational. Sound? Unimportant. Multitasking? If it runs Lotus, who needs it? But even the hardest-nosed would be impressed by the NewTek Demonstration Number Three that we feature this month, oddly, some might think, as Amiga Art.

Demo Reel Three is such a brilliant example of the art the Amiga can achieve that, although it is actually a promotion for NewTek's products, we believe it is not just state of the art but, in its own terms, a work of art. It cleverly embodies all the talents of the Amiga - its graphics, its sound, its multitasking, its versatility in

creative areas. Its sheer fun; in fact the reasons why today's Amiga users bought their machines.

We all ought to be grateful to NewTek's Tim Jenison and his Kansas rollerskaters for the outstanding job they do both on their products and keeping us entertained.

I said there were two secrets and only revealed one? The second is a genuine secret but, of course, impossible to keep. CBM are planning an Amiga CD console. The story is that the device, I don't think I can call it a computer, will play CD game disks and take them into memory. Portable CD player size, you can play ordinary CD disks on it too.

I kid you not, the CD Amiga exists and was shown to software houses in the U.K. a short while ago. (I told you they couldn't keep their mouths shut, didn't I?). The price is said to be about £500.

Commodore continues to amaze us. One moment it wants to be taken seriously with its UNIX boxes and the next it is nervously putting up the Amiga to compete in the toy shops with the Nintendo and Sega £100 consoles. Perhaps Commodore should learn from Atari, run by ex-CBM boss Jack Tramiel, who have not very successfully attempted the same route, happily selling consoles but hardly convincing businessmen to buy their PCs.

There is talk of a cartridge-based 64, which makes some sense in the pre-teen market. But producing an "Amiga Toy" is not likely to impress their businessmen fathers. Commodore would do well to remember that it is the A500 - and even the A2000 - that gave Commodore its success at the end of the 80s and will offer a lot of mileage for this decade. Certainly UNIX will come - and probably so will the consoles. But it is doubtful that anyone, not even CBM, could achieve commercial credibility in both.

Antony Jacobson
Managing Editor and Publisher

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CHAMPIONS OF DRYNN ARE COMING

The saga of *Pool of Radiance* 16-bit continues, as it is now consigned to the "no confirmed release date" file. *Champions of Krynn*, however, is being programmed in-house at SSI, the Amiga version by Norm Kogel the programmer responsible for the well received *Stellar Crusade* and *Red Lighting*.

The storyline of this Role-Playing Epic is set in TSR's *Dragonlance Role-Playing World of Krynn*, and is not linked with *Pool of Radiance*, except that it uses an enhanced version of its award winning predecessors game system.

The player guides his party of characters through a web of intrigue and combat of defeat a plot by the forces of evil to establish the dark Queen Takhisis as undisputed Ruler of Krynn.



Player characters include *Kenders and Knights of Solamnia* in addition to the races and character classes found in *Pool of Radiance* and *Curse of the Azure Bonds*. Players will have the opportunity to meet and work with characters from the *Dragonlance* novels -

Tanis, Tasselhoff and Caramon - as they struggle to overcome the forces of evil.

Champion of Krynn will be the first full blown role-playing game to be released on the Amiga in the AD&D computer products range. It will also be released in a 64 version.

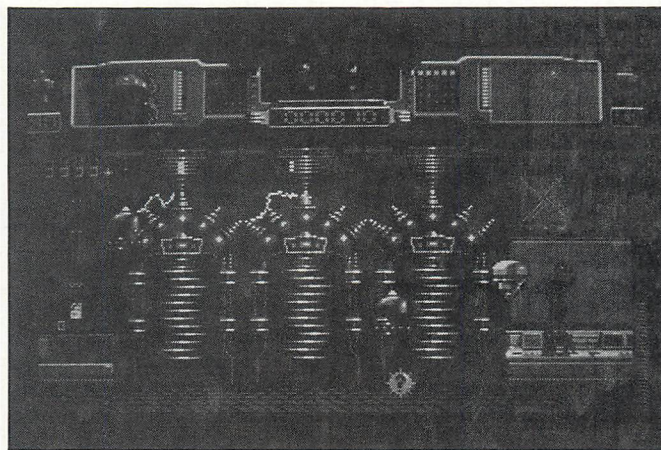
THE WORM TURNS

The creator of the computer "worm" that infested the US Internet research and development network in 1988 was found guilty last month of intentionally disrupting the nationwide network.

Robert Morris had testified earlier in the month in US District Court that the rogue program spread faster than he expected. He said he had wanted to see if he could write a program that could spread widely - but it got out of hand.

Morris testified that he did not realize he had made a programming error until three hours after he introduced the worm. At that point, he said, he enlisted a friend to warn network users of the problem. The 24-year-old Morris now faces as much as five years in prison and a \$250,000 fine.

HAMMERFIST



Activision are releasing a strange new game about a corporate body that produces and operates holograms so powerful that they have taken over the two main cities of the planet.

Two holograms, however have personality modules irreversibly damaged in an electrical malfunction which has fused them together.

Code-named *Hammerfist* and *Metalisis* they are set on a mission to destroy the hub of the Metro-holographix and so regain their separate identities again.

Just to keep your life peaceful hideously mutated beings are out to get you from all sides as you make the journey.

THE NINJA SPIRIT

Activision have announced the release of a new arcade conversion taken from the Irem copin-op. The game has seven levels, graphics and parallax scrolling.

Travel the chinese plank, equipped with Samurai sword, Deathstar, dynamite and lassoon razor blade. Dodge the devil spearsman who will stab you from underneath (ouch!) Catch the crystals which will give you ninja spirits to help you fight on, extra energy or the chance to use the flame rope in your most desperate moments. (Like receiving O.T.T. press releases!)

Grapple with PR people, ninjas, giant swordsmen, flying kitemen and diving wolves. Trundle over marshland and through forest, but don't get squashed between those boulders or stand on those bamboos. Climb the shearest of rock faces and watch out for poison gas. Will you ever get to the top? Do you have what it takes to confront the Last Warlock? Destroy him and you can go on to play with the wolves. (Or back to sleep....)

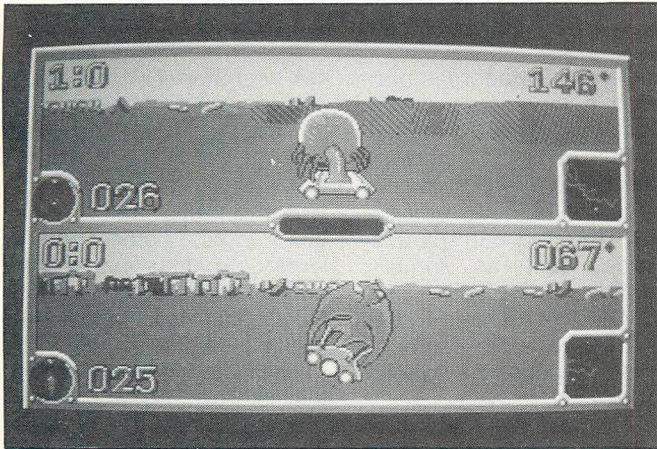
NEC CLAIMS FIRST PORTABLE CD-ROM

NEC is wooing accountants, medics, and architects with what it claims is the world's first portable CD-Rom drive.

The unit weighs 2.2 pounds and measures 21 x 40 x 60 cm. The company is positioning it as an accompaniment to laptops and luggage.

Transmission speed is 500k per second and average seek time 700ms. It also has a SCSI and optional 1.5-hour battery. Priced around £500.00.

GO FOR IT, GONZO!



Wipe Out is an intergalactic hoverboard challenge. Well, maybe its more of a life or death struggle between the forces of evil and some punter waggling a joystick.

Or perhaps just an excuse to stay by your machine instead of going down to the pub at lunchtime and have just one more go... At least that's what new software house Gonzo Games tell us with admirable lack of hype.

There are myriad different species of opponents and your main task is to get to the centre of a humungous galaxy (over 1,000 stars, each with up to eight planets and two different arenas) and qualify for the hall of fame all-time winners tournament. In each local league you can bet on your own game as well as the

other matches in order to increase your credit rating and travel or purchase equipment. Any match in the league can be watched as all matches actually take place! You can save your position and arrange to meet a friend on a nearby planet for a challenge which will affect both your ratings!

There really is no feeling quite like turbo-boosting past you hapless opponent, hanging a wickedly fast 180 degree turn and sliming across his path before he's realised what's happening. "Be warned - Wipe Out may be the only game you'll want to play for some time..." (Oh dear, we thought there was not going to be any hype... Well, at least they said 'some time' - not 'forever' or 'ultimate' as software houses generally claim).

MOUSE TRAPPING

Design a better mousetrap and the world will beat a path to your door - so runs the popular myth for would-be inventors. Well, an alternative to the Tom and Jerry style mechanical mousetrap - an electronic mouse detection system, called Mouse Alert - has been patented in the UK by Rentokil. This is nothing to do with mice that you plug into a computer - this is the real furry McCoy.

The system is intended for buildings where even an occasional mouse cannot be tolerated, or where the conventional methods, like poison, cannot be used. It consists of a series of carefully

cited sensor boxes, designed to encourage mice to enter them, connected by cables to a control panel. Lights on the control panel warn the operator of the presence of a mouse. The sensor box is then replaced by a trapping box to kill off the mouse without the use of chemicals.

The infra-red beams that trigger the sensor in each box are protected by baffles so that only something the size and shape of a mouse will set off the alarm.

Once trapped in the box, the mouse is at the mercy of the pest controller. The usual method is lethal dose of anaesthetic.

26 000 PAGES PER DAY

A document reading system which can cope with up to 26 400 hand-written or printed documents per day, but it should be economical for as few as 600 per day, has been introduced by Siemens Data Systems.

The A11font System 2800 highlights unrecognised characters on screen with a prompt, often requiring a single-key operation to make a correction.

The system comprises

two readers which scan and store the data image, up to A4 size, and is based on the company's MX300 micro running Unix. It can be expanded to support six display stations and two printers.

The multitasking 32bit processor enables documents to be edited while new ones are being read. The system is equipped with a 310Mbyte hard disk and can be networked.

MOTOROLA'S 'OH FORTY' EMERGES

More details are emerging on the next generation of 68000 chips - the 68040. With the introduction of a new high performance member of its 68000 family of microprocessor chips, Motorola aims to capture an increased share of the computer segment of the microprocessor market.

The new 68040 is faster and more powerful than Intel's latest 486 chip, Motorola claims. The "oh forty", as it is called, is also fully compatible with earlier Motorola microprocessors for example, the 68000 used in the Amiga.

This will allow computer developers and purchasers to protect their investment in software.

Delivering 20m instructions per second and an average of 3.5m floating point instructions per second, the 040 also rivals the performance of most reduced instruction set computer (Risc) chips from companies such as MIPS Computer and Sun Microsystems.

But the 040 is late. Motorola first announced the product last spring and promised to deliver it by the end of

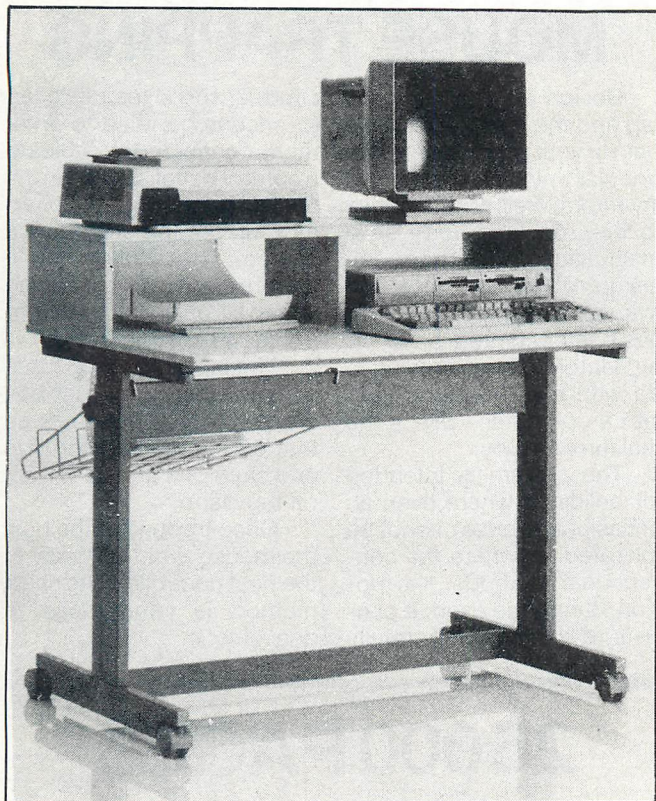
1989. Instead, the company has just begun shipping samples to major customers and will not begin volume shipments until the middle of the year.

According to some industry analysts, the delay has cost Motorola the opportunity to have its new microprocessor designed into the next generation of computer workstations. Sun Microsystems, for example, has announced that it will focus future developments on Risc chips of its own design.

Still Motorola claims to

have more than 30 customers committed to using the 040 in computer systems. The list includes Commodore, Apple and Hewlett-Packard, the biggest names in desk-top computing, who are important Motorola customers.

As with its earlier microprocessor chips, Motorola also expects to find broader markets for the 040. As production volumes increase and prices come down, the chip may find its way into laser printers, disk drive controllers, telephone equipment and eventually cars.



LOW COST NETWORK ALTERNATIVE

Comtel Datacom is marketing a low cost network alternative for the PC market.

The 3X-LINK16 network uses the parallel port to connect up to 16 PC's and Laptops. The users can share resources such as Printers, Databases, Plotters, Files etc. There is no need to tie up a PC as a file server or install expensive adaptor cards.

The cost per station including the external parallel port adaptor and software, is less than £120, excluding cabling. Up to 16 optional printer spoolers could be used across the network. A

two user Starter Kit, including cable is less than £250.

This is a very suitable system for offices which have less than 16 PC's, a few printers and other related facilities using the parallel port. It works in background mode and offers automatic script, electronic mail and multi-level password.

It is easy to install, maintain and expand as requirements increase.

An optional communication facility is available for any PC on the network to communicate using a mailserver modem. Contact: Comtel Datacom 0223 420263

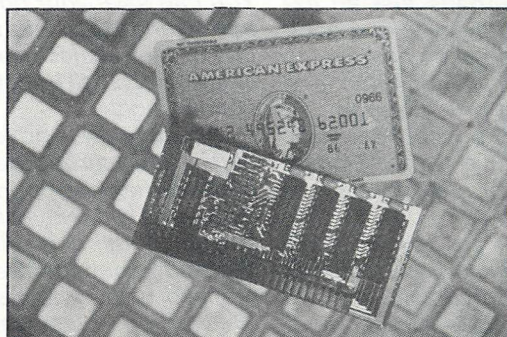
NEW DISK FILE UNITS

Accodata's new Disk Files are storage units made from high-impact, anti-static moulded plastic, and fitted with locks with special anti-static keys.

The 3 1/2 inch version, at £51.40, has three drawers designed to hold a total of 180 diskettes, but which can equally well hold 30 mini data cartridges, 30 audio cassettes, or 2 microfilm reels. The 5 1/4 inch version, at £43.15, has two drawers which can hold a total of 20 diskettes, 18

DC 600-type data cartridges, 4,000 micro-fiches, or even 80 compact disks.

Disk File units can be used individually or stacked, and are mounted on non-slip, anti-scratch pads. Drawers are removable, have built-in handles for safe carrying, and slots for easy labelling; four dividers are supplied with each drawer. Contact: Action Computer Supplies, Abercorn Commercial Centre, Manor Farm Road, Wembley, Middx, HA0 1WL.



NEW HALF MEG BOARD

Memory Expansion Systems have released their latest half meg board for the Amiga 500. It measures just 4 centimetres in width and is claimed to be the smallest board available on the mar-

ket. It is supplied with a one meg demo specially designed by a leading software development house. Contact: Memory Expansion Systems Ltd 051 236 0480.

LOCK IT UP!

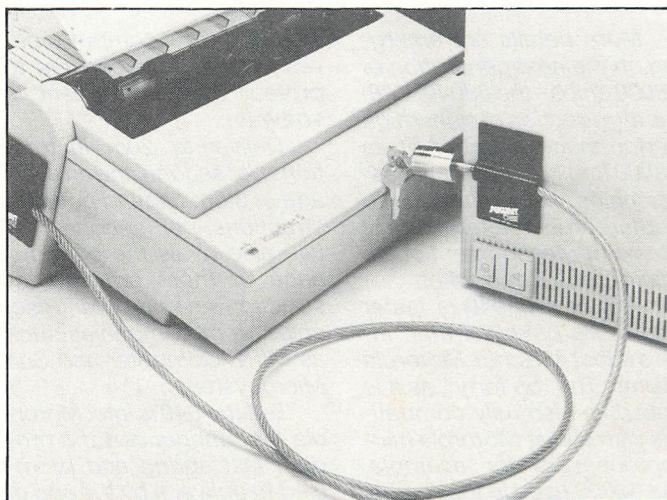
Intended as a deterrent against casual theft from unattended offices, Sekurit have launched a security kit offering protection for up to three items of computer or office equipment such as vdu's and printers.

It consists of four heavy-duty self-adhesive metal plates, which the user attaches to desk and equipment, and which are connected by a high-tensile flexible cable fitted with a locking unit at one end. Its advantages are that it can be fitted without tools in a matter of minutes, and when in

use does not prevent the operator from moving equipment around on the desk.

The Sekurit, complete with two keys, is available at £29.00.

Other security equipment available from Action includes heavy-duty aluminium transit cases for tapes, disc pack and cartridges, and a wide range of fire protection safes. Contact: Action Computer Supplies, Abercorn Commercial Centre, Manor Farm Road, Wembley, Middx, HA0 1WL. Tel: 0800 333 333



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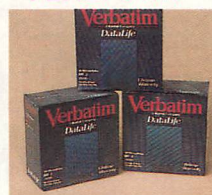
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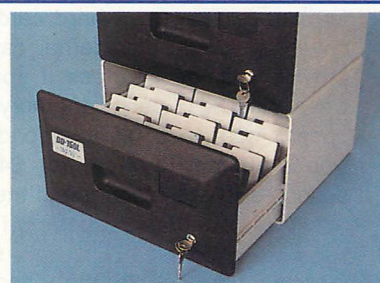
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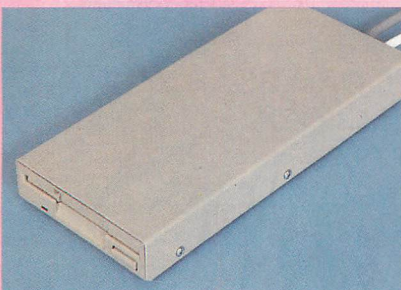


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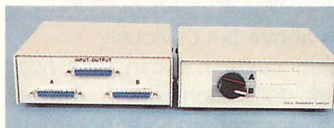
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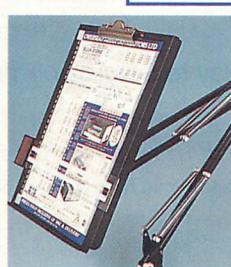
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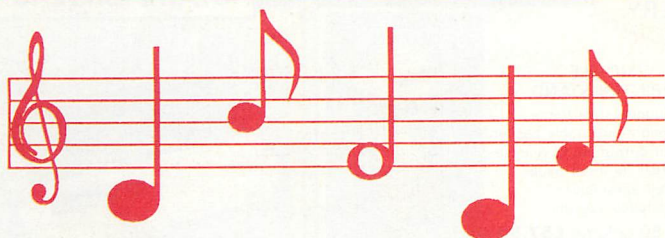
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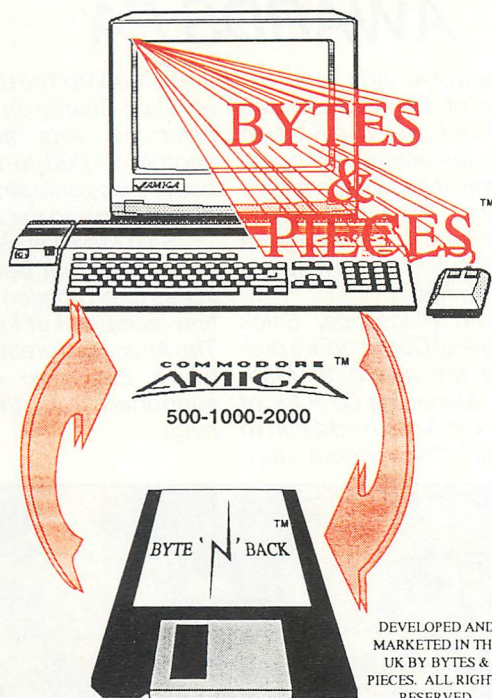
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NEW E-MAIL SERVICE SEGMENTS DRIVE MARKET GROWTH

The total world market for electronic mail services was about \$600 million (£400 million) in 1988, and is expected to grow through 1995 by a compound annual rate of 34.6 percent. Growth is stimulated by the need of business and government customers to find a more cost-effective, quick, and paperless form of communication. These and other key findings are revealed in a new report, "US-based and Worldwide Electronic Mail Services Market," just released by market Intelligence Research Company.

Two market segments are expected to climb from zero to over 1.5 billion dollars (£1 billion) by the end of the 1995

forecast: (1) Applications - specialized E-mail message sending formats used to expedite and automate the sending of a particular type of message that is used frequently; and (2) Media Transformation - systems that allow E-mail messages to be converted to other media for final delivery.

Rapid growth is also attributed to competition among the major E-mail service providers, due to deregulation in the marketplace, and the expansion of services available for E-mail. Strong growth will prevail among those companies able to market to specific niches in the industry, by providing value added services to customers.

EA POPULOUS AWARDS



At the Computing Industry Dinner recently two awards went to Bullfrog Productions. The first was the Programmer of the Year award and the Best Original Game of 1989 for Populous.

Populous has now sold over 80,000 copies in Europe on the ST and Amiga formats and with the PC version now released the game should soon hit the 100,000 mark.

Said Mark Lewis, Managing Director of Electronic Arts, "We are delighted about the awards for Populous. It really seems as though it is recognised throughout Europe as the best game of 1989."

COMMODORE AWARDS EA

Electronic Arts was the winner of the Commodore award for Enterprise & Vision which was presented for the first time at this year's Industry Dinner. The award went to DeluxePaint III as the product that best utilised the features of the Amiga.

David Pleasance, Sales Manager of Commodore presented the award to Mark Lewis, Managing Director of Electronic Arts. In addition to the cup Commodore don-

ated £1,000 to The Royal Variety Club Charity on behalf of Electronic Arts and gave another £1,000 to the company. Electronic Arts in turn donated this to the charity.

Said Mark Lewis, "We are very proud that DeluxePaint III has been chosen to be the first recipient of this award. The Amiga is a great machine which Electronic Arts has supported from the beginning."



688 ATTACK SUB

Electronic Arts has announced the release of 688 Attack Sub on the Amiga. 688 Attack Sub is a simulation that puts the player in command of a top secret, billion dollar submarine, pitting him and his crew against a deadly fleet of submerged, surface and airborne targets around the globe. 688 Attack Sub features 3-D graphics and digi-

tised sounds, such as sonar pings and whale songs.

The program give the player the opportunity to captain a US Los Angeles class sub or a Soviet Alfa and to hunt and evade enemies using the world's most advanced submarine technology, like 3D sonar contour imaging. The player can master all the responsibilities himself or delegate them to his crew. Crew members come to life with actual digitised pictures when they report. Enemy vessels have a mind of their own. Their behaviour is unpredictable and deadly. 688 Attack Sub allows the player to control sophisticated weapon systems like Harpoon encapsulated missiles and wire guided torpedoes.

688 features ten different scenarios. Also included is a time compression option to get to the action faster. Price £24.95.



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CYGNUSED PRO 2.0

ASDG has announced a major upgrade to CygnusEd Professional, the award winning text editor for all Amiga computers. New features include unlimited undo/redo and a turbo search and replace mode 100 times faster than that of first release of the product.

Other CygnusEd Professional enhancements include faster and more powerful macros, expanded AREXX support, alternate screen fonts for enhanced readability on high resolution displays, and a unique programming language support feature that helps Modula 2 programmers quickly find and correct syntax errors.

Version 2.0 of CygnusEd Professional also features a powerful file requester library that will be made freely available to other developers

wishing to help standardize the Amiga user interface.

Programmers will find the latest version of CygnusEd Professional particularly useful thanks to the 100 fold speed increase in CygnusEd's turbo search replace mode, together with expanded Arexx support. And, for anyone writing code in the Modula 2 language, there is now a "jump-to-byte function" that gives immediate access to syntax errors identified by compilers that use byte offsets to mark syntax errors.

Not only is Release 2.0 of CygnusEd Professional more powerful, it can also be made more readable. Users can now select another fixed width screen font in place of Topaz 8, allowing larger fonts to be used with high resolution displays.

ASDG has also done its part to help standardize the look of the Amiga user-interface by making CygnusEd's sophisticated file requester library freely available to the Amiga developer community. By creating a practical, useful requester library that can be freely used by other developers, ASDG hopes to foster a greater standardization of common functions in Amiga-standard personal computing.

Amiga operating system creator, R J Mical said of the file requester contained in the library, "Finally, a file requester better than mine." The requester library was developed by CygnusEd Professional's authors, CygnusSoft Software Inc and comes with complete, updated documentation.

Best-known in the Amiga

market for such widely used products as the Recoverable RAM Disk, FACC II and the first megabyte memory expansions for the Amiga 2000, ASDG's recent releases include the Twin-X universal input/output board for the Amiga 2000 and 2500 and Professional ScanLab scanner interface that bridges Amigas and the JX-series of colour scanners from Sharp Electronics Corp.

CygnusEd Professional Version 2.0 carries a retail price of \$99.50. Owners of earlier versions of the product can upgrade by sending \$25.00 plus their original CygnusEd disk to ASDG Incorporated, 925 Stewart Street, Madison, WI 53713. Tel: (608) 273-6585.

ARE YOU GREEN? BUY DIGITA!



Digita who specialise in economically priced utilites have announced that all of their packaging will now be 'environmentally friendly'.

Digita's Jeremy Rihll commented, "Since October every Digita product, including packaging, manuals, brochures, has been manufactured using Environment Friendly paper. The extra cost is a small sacrifice and I would encourage those manufacturers who require high quality paper beyond the standards of fully recycled paper, to seriously consider the Environment Friendly alternative."

Well done Digita! Will other companies please copy!

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Following the run-away success of HORSES, Real-Things BIRDS continues with the RT philosophy, opening doors to discovery and adventure; giving Amiga-lovers the chance to recreate the fascination we all feel when watching birds in their natural environment.

THE 16 BIT FLYING START

It is say Westminster, the organisers, cheshire cat grins all round as the first 16 Bit Computer Fair got off to what they say was, "a great start" when over the three days more 18500 members of the public viewed more than 100 companies selling 16 Bit

Computer products.

With the exhibition halls bulging at the seams with publishers and dealers, Westminster believes it was just what the home computer industry needed.

The next 16 Bit Computer Fair will be a 4 day event at the

Royal Horticultural Halls from Thursday June 28th to Sunday July 1st with the first day being a Press/Trade/Red Carpet day. Opening hours will be 10 to 6 each day with the show closing at 4 on Sunday. Contact: Tim Collins 01-549 3444

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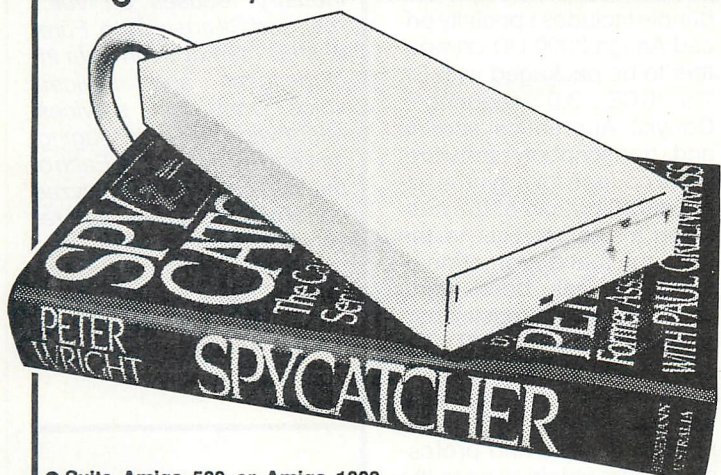
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HEWSON ENTERS 4TH DIMENSION

Hewson, King of the shoot 'em up, are releasing a compilation of new games for the 64.

INSECTS IN SPACE: Deadly insects have invaded earth, killing all but very young human offspring. You are the Arch Leader of the Motherhood, Saint Helen Bak. Use your laser-powered eyes to stop "Killer" bees swooping-in and picking-up "babies of fun", dropping them from great heights in their bid to obliterate all. They must be stopped before they destroy the

human race! Designed and written by Sensible Software of Wizball fame.

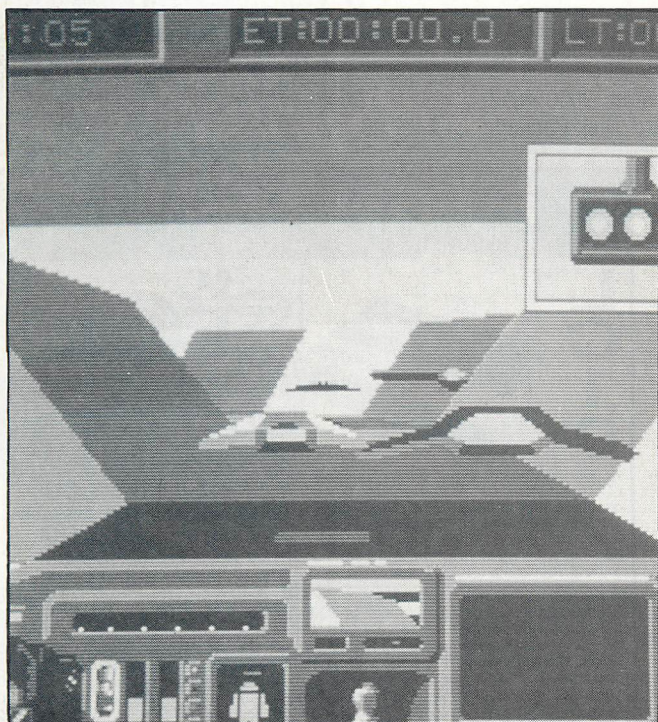
CYBERDYNE WARRIOR: Escaped droids must be recaptured. You are the last Cyberdyne Warrior and you must return captives to the Prison Satellite orbiting the planet!

MISSION IMPOSSIBLE: Baby orbs have been suspended around the planet Roboid. Follow direction of compass to collect pieces of scroll and complete rescue mission. Fire deadly bubbles to destroy attack-

ing aliens, orbiting skulls and revolving eyes.

HEAD THE BALL: Gobba, (he's the spitting image of a programmer we know!) leader of the Globoid Hells Angels, has taken captive Head's girlfriend. The globoid gang bound paths and alleys protecting their turf. Avoid their contact and destroy their allies the Nail-Heads. Follow arrows and collect diamonds to trade with Gobba for the safe return of your beloved! Priced at £12.99 cassette and £17.99 disk.

POWERDROME



Electronic Arts has announced the PC compatibles release of Powerdrome, the Futuristic racing simulation by Michael Powell. In the game the player gets the chance to become a jet racer pilot competing in the Powerdrome XXIV against four pilots from other galaxies. At stake is the coveted Cyberneufe Trophy.

Powerdrome features fast moving solid 3D

graphics which create an effect of speed and realistic sound effects of engines roaring, competitors screeching past and crashes and bangs as the five jet racers fly around the course. The game supports Hercules, CGA, EGA, VGA and Tandy graphics modes, as well as the PC speaker, Tandy, AD-Lib and Roland MT-32 sound boards. Price £24.99

DR. T'S AND COMMODORE SINGALONG

At the National Association of Music Merchants annual show in Anaheim California on January 20, 1990 Commodore and Dr. T's Music Software announced a joint bundle and promotion. The bundle includes specially priced Amiga 2000 HD computers to be packaged with Dr. T's KCS 3.0 sequencer, Copyist Apprentice scoring and transcription software, and a coupon for a synthesizer editor/librarian of the customer's choice. This is the first time that a promotion of this type has been done aimed at serious musicians.

Al Hoppers, CEO of Dr. T's says, "Sales of Amiga software has been growing at an unprecedented rate. Serious musicians and professionals are catching on to the fact that the Amiga does things that on other computer does. With the introduction of our Multi Program Environment for the Amiga users can do things with multitasking and dynamic data exchange that are not possible on Mac's or Atari's. And release of the Phantom SMPTE box gives the pro access to the same synchronization capabilities available on the Mac and ST".

MIRC's REPORT ON VOICE MESSAGING

We recently reported on the growing area of voice computer communications. According to a new report, "Voice Messaging Services Market," just published by Market Intelligence Research Company, the technological explosion of voice processing equipment and its increased sophistication are expected to have a positive impact on the voice messaging industry up to 1995. The report reveals that this trend is due to the increased use in the home and business segments. The most noticeable hurdle for development is customer unfamiliarity with the advantages of technological advances. The report projects an increased market demand, one in which there will be room for all levels of service providers.

This in-depth analysis of the voice messaging services industry focuses on voice mail and CII answering. Forecasted market segments include: local and regional voice message services, nationwide voice messaging, and end-user by type. Each of these segments are analyzed in terms of revenues and revenue growth rates, and comprehensive market and technological trends.

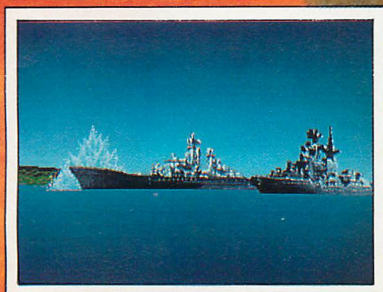
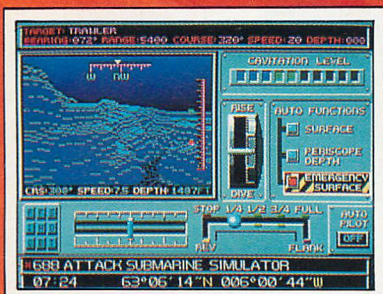
Contact: MIRC Europe, 55 rue Vandenhoven, 1200 Brussels, Belgium.

AMIGA TV SHOW

In the USA a new show is starting on cable television. Initially only in New York, it is called, Amiga Video Magazine. A half-hour "magazine" format show, Amiga Video Magazine will feature items on Amiga applications, news, and personalities.

688

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Screenshots represent IBM version, we think the Amiga version looks even better!

ELECTRONIC ARTS™

Creating the s



When AUI exclusively revealed to the Amiga users in Europe, the wonders of Cinemaware's "Defender of the Crown", the game was credited with selling more Amigas than anything else in the history of the machine.

In the U.S.A. the same effect was caused by NewTek's Demo Reel 1. This series of demonstrations, created on NewTek's Digiview, sent thousands of buyers hurrying to their dealers with cash in their hands.

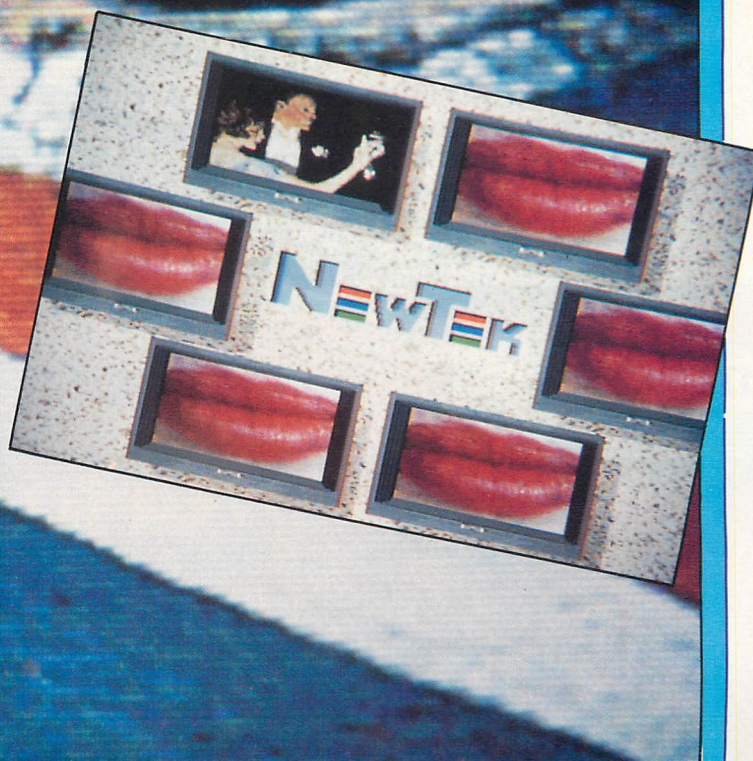
NewTek, perhaps more than any other company, has symbolised the success of the Amiga, staying the course when many others have fallen out. It has not been just the lovely Laura Longfellow who appears so often in their publicity, but the creationns of tenacious Tim Jenison and persuasive Paul Montgomery and the talented team they have built, that has kept

State of the Art



NewTek at the leading edge of the Amiga (and inspired the creative alliteration here!).

Now their Demo Reel 3 has been released. It is truly stunning, a burst of publicity - yes, it includes Laura! - that not only demonstrates the outstanding qualities of NewTek products but becomes a piece of history in its own right, genuinely expressing the state of the art in Amiga graphics in both technical and artistic terms. (Mark Randall stand up and take a bow!) Rightly, NewTek has created a special limited edition of 1,000, labelled and packaged, of which AUI is the proud owner of an example. However, other copies should be available on Public Domain. Sensational is an understatement! Beg, borrow or steal a copy. If there is any justice, Demo Reel 3 will do for the Amiga what sex has done for the human race!



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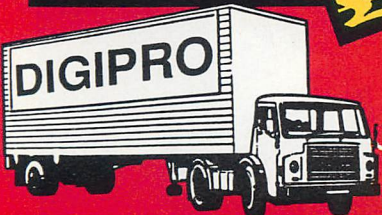
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COMING AT YA!

Pixelations is not an Amiga disease but a US company who have created a new format that lets you see invisible images. The only trouble is that it does not exist. John Walker explains.

A gap in the desktop publishing tools available to the Amiga is rapidly being plugged by some excellent products from Pixelations. These consist of attractive typesfaces, clip art and utilities that can be used either with a PostScript-compatible printer or with the company's own PostScript language interpreter PixelScript 1.1.

All are designed to work with the Amiga's DTP and graphic word processing programs that have a PostScript capability: Professional Page, PageStream, City Desk 2.0, Shakespeare, PageSetter with LaserScript, ProWrite with ProStream and Excellence!

Pixelations plans to release several

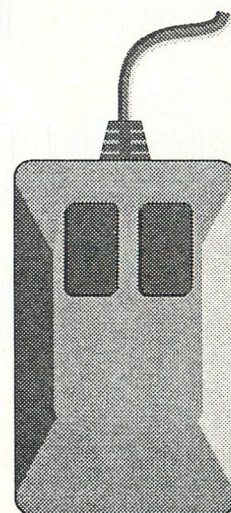
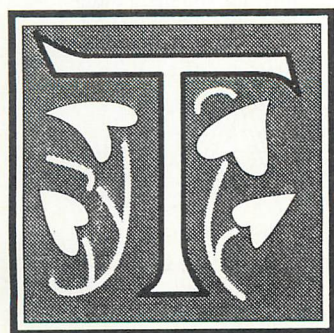


disks devoted to typesfaces or clip art and associated utilities. Available first is a Sample disk which covers all three areas.

It contains Cinema, a typeface that looks as if it is made of neon tubing; Cinema UltraThin, which is finer version better suited to dot matrix printers; Amiga Keys, a typeface consisting of representations of the Amiga's special keys that will be mainly of interest to producers of manuals for the computer, some assorted clip art and a useful Zoom effect generator which can be used with any PostScript typeface.

For those who don't have a Post-

Script printer - and at £4,000 or so, few can afford them - and who don't want to pay to use a High Street bureau's laser printer, then Pixelations' PixelScript 1.1 provides a more affordable alternative. It is a program that enables you to obtain the high quality output provided by PostScript with any Preferences printer - from dot-matrix to inkjet and such non-PostScript laser printers as the popular HP LaserJet series. PixelScript is supplied with two typefaces, resembling



continued from page 21

Times and Helvetica, and allows you to rotate images.

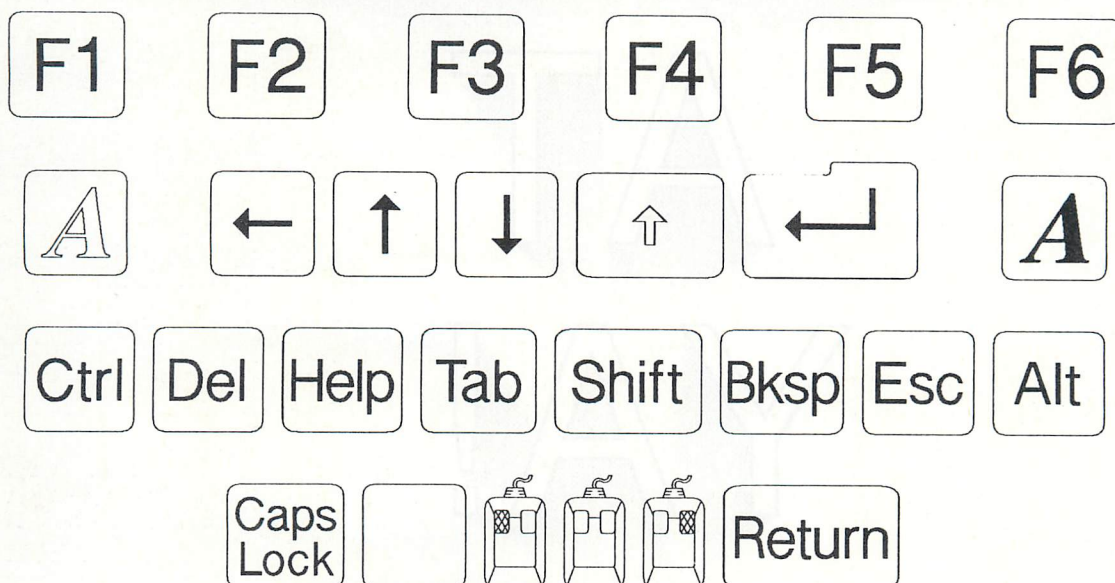
I have not tried the program, but those who have tell me that its output is excellent, although to print an A4 page takes time - at least 15 and as much as 50 minutes - and requires at least 1 megabyte of memory and preferably

series, but Pixelations is offering a free upgrade to v1.1f to registered owners of earlier versions (1.1c, 1.1d and 1.1e; the version number can be seen on the copyright notice on screen as the program is loaded) when they buy one of the disks of typefaces or art.

For the first time on the Amiga, Pix-

displayed only as a shaded box, although it can be re-scaled like any other graphic.

To overcome this problem, Pixelations has created a new format that combines a bitmapped image in the Amiga's standard IFF format with the PostScript code, so that you can see the



more. To an extent, it has been rendered somewhat redundant now that the two leading Amiga desktop publishing programs, Professional Page 1.3 and PageStream, use outline fonts that provide good results even when used with 9-pin dot-matrix printers.

Users of early versions of PixelScript may have difficulty using some of the more elaborate art included in the

elations provide clip art in Encapsulated PostScript (EPS) format. The way the company handles its EPS images has been accepted as a new Amiga standard by Commodore. An EPS graphics file normally consists of a mathematical description of the image in the Postscript page description language. Its disadvantage is that you don't see what you get until you print it. On screen it is

image on the screen. Without the use of PostScript or PixelScript, only the IFF image will be printed. With PostScript and PixelScript, the IFF image is ignored and the PostScript code is used to print the image without the jagged lines associated with bitmapped graphics.

At the moment there is only one problem with new format, which is called AEPS: you can't use it! No desktop

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TEST DRIVE

continued from page 22

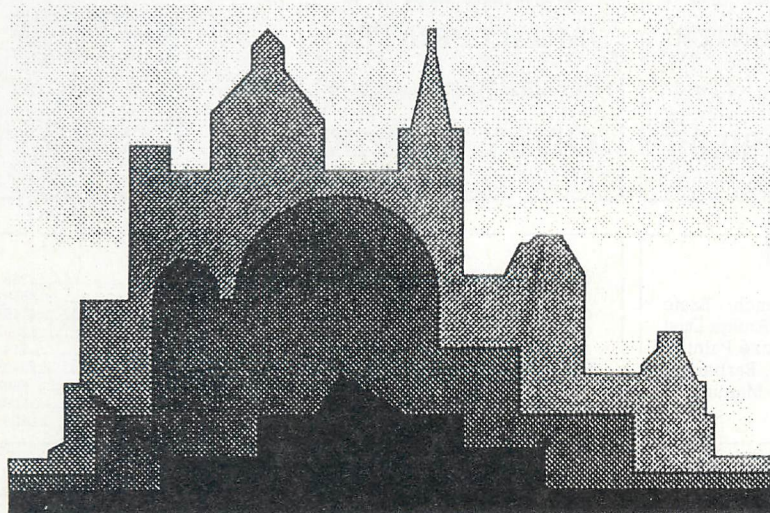
publishing or graphic word processing program recognises it. If you want to use Pixelations' clip art in bitmapped form, you can load an AEPS file, when all the PostScript information it contains will be ignored.

But you can't use it in its present form for PostScript output. Pixelations gets round this difficulty by providing a

tive base on which you can superimpose any capital letter.

Helpful manuals are included, with holes punched in them so that they can be filed in a loose-leaf folder. They reproduce all the clip art and show samples of the typefaces with suggestions on how they can be used to best effect.

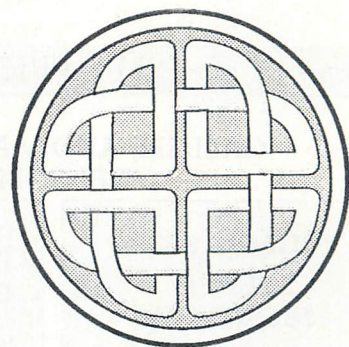
The disk includes a program to in-



utility to strip the IFF definition and leave you with a straightforward EPS file in ASCII format that can be loaded into any program accepting EPS, which on the Amiga is currently restricted to Professional Page 1.3 and PageStream - and you may have trouble with PageStream if the EPS file is more than 64K in size.

It is an indication of the Amiga failings in this area that Pixelations' EPS images were created on a Macintosh, using Aldus Freehand, a graphics program that Commodore's computer cannot yet match - although I'm keeping my fingers crossed that Gold Disk's about-to-arrive Professional Draw 2.0 might rise to the challenge.

The sample art includes drawing of the three Amigas - 500, 1000, 2000 - together with a keyboard, six views of a monitor, a floppy disk, a mouse and the Amiga checkmark. There are also images of a cityscape, a cactus, a cat, a pear, a celtic knot, a letter T with some Art Nouveau decoration and a decora-

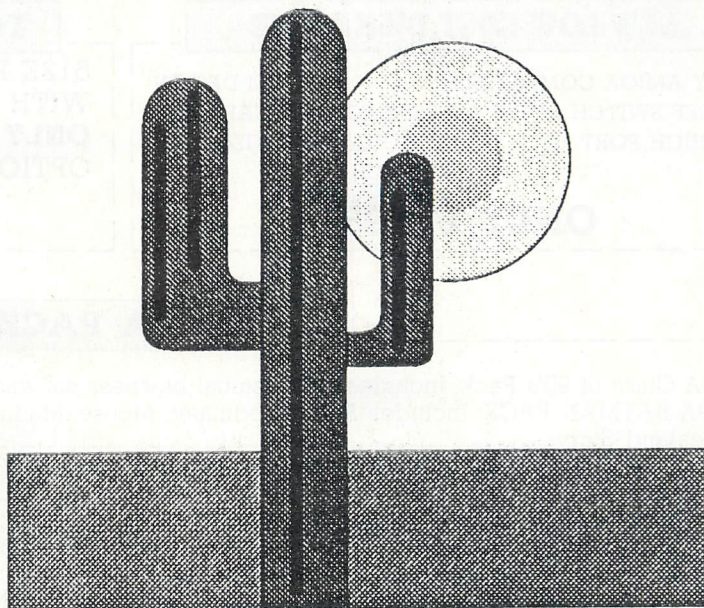


printer. The simplest way to do this is to use the AmigaDOS COPY command, followed by the device name for the serial or parallel port.

To download the Cinema font, I opened a CLI window and typed "COPY Cinema.pstoPAR:", since I have my printer connected to the parallel port. It takes less than a minute to download the font. Or you could use the ICONX command in your Workbench's C directory to execute a suitable script file whenever you needed to download a typeface.

The only other failing of the manual is that it does not show the different types of effect that can be achieved with its Zoom generator, which creates an EPS file that can then be loaded into your DTP or suitable word processing program. You'll need to experiment.

On the way from Pixelations are four



on its description of another necessary step: downloading a typeface to a PostScript printer. Before a PostScript laser printer can use one of Pixelation's typefaces it will need to have it in memory, unless you are using PageStream which will download it automatically.

To achieve this you will also have to install another file on the disk, which contains the typeface's description in ASCII format. Before printing a document this will then have to be sent to the

volumes of typefaces, including some unusual calligraphic, Art Nouveau and Art Deco styles, and several volumes of clip art, with around 25 images to a disk. They, like this Sample Disk, will be very welcome as a means of extending the possibilities of desktop publishing on the Amiga. Pixelations' PostScript Series Sample Disk \$65.00. Pixelations Inc., Post Office Box 547, Northborough, MA 01532, USA. Tel: 508 393 7866.

J.W.

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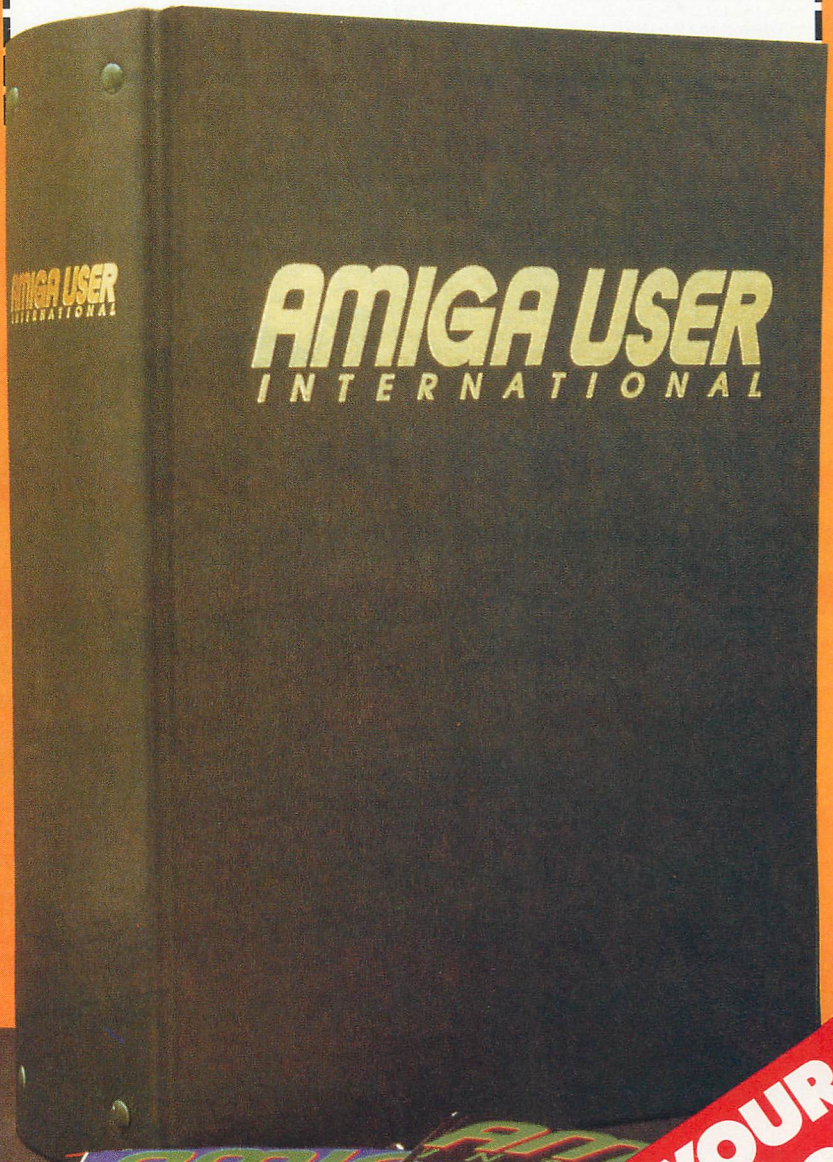
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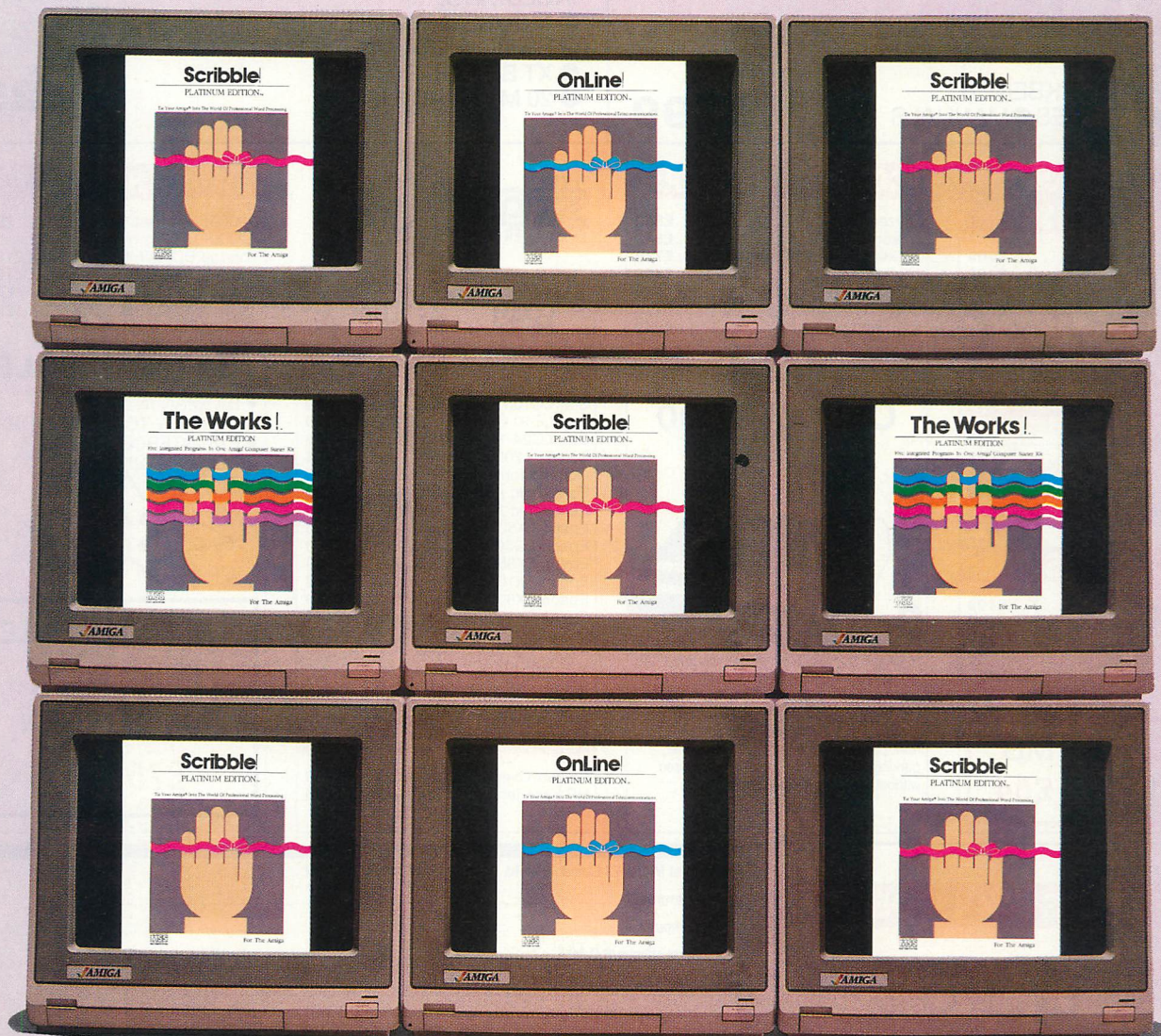
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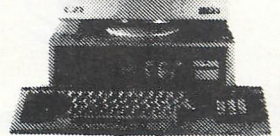
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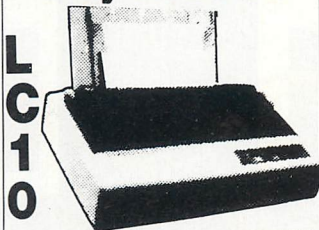
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Amiga Letters

Dear AUI

I am writing to ask where I can buy the monitor stand that you had displayed on your February Issue cover, as it looked brill, also does the Amiga 500 Control Centre block the slot for the A590 hard drive?

Thankyou,

Mr. E. Ismael, Brockley, London.

Dear Mr. Ismael,

The monitor stand on our February cover and the Control Centre are one and the same thing and are available from our Readers Offers department. At £50.45 including vat and postage it represents excellent value for money and, no it doesn't block the expansion slot on the side of the computer. You will find the necessary form to complete elsewhere in this issue of AUI.

Dear AUI

In my job as a Secretary for the St John's Ambulance Brigade I have to write a considerable number of letters and fill in lots of forms. My Word Processor (Protext) is great for letters and its typewriter mode is fine for the envelopes - however it does not work well on the forms. What I need to do is move the printer head every time I press the Spacebar. Do you know of a program which can do this?

Colin Parry, Salford, Lancs.

Dear Colin Parry,

First, we suggest you contact Arnor with the problem - they may be able to help. If you are still stuck, Digita International produce a package called E-Type which is a typewriter emulation and may be more suitable.

Dear AUI,

I'm a confused newcomer to the Amiga, and wondered if you could answer a couple

queries. First of all, why do most games leave a wide black strip at the bottom of the screen? I've seen the whole screen used in a few games, like Kick Off, so why can't the rest do the same? Secondly, I'd like to know if it's possible to connect my Amiga to my hi-fi, as the speaker on my portable TV is so small and tinny, that it doesn't do justice to some of my better games and music demos.

Yours sincerely,

Ian Williams, Colchester, Essex.

Dear Ian,

There are a couple of reasons why programmers often neglect the bottom part of the Amiga's screen. As you may know, the American TV system uses fewer lines to make up its picture. Fortunately, Commodore had the sense to give the Amiga the ability to fill the higher resolution screen of the European TV system, known as PAL. If a program uses that bottom section of a PAL screen, it won't run properly on the American NTSC system. Converting a PAL version of a program to run on NTSC is usually not too much trouble, but probably because of tight deadlines, programmers choose not to take advantage of the extended screen size.

The second reason is that a lot of Amiga arcade games written in the UK are developed on the Atari ST, which cannot display full PAL graphics. In the case of many games "ported" from the ST, the program ignores the Amiga's specialised graphics chips, and instead struggles to move large graphics around with routines written by the programmer. In those cases, extending the screen would just make things slower.

On the subject of hooking up your Amiga to your hi-fi, the answer is simple. All you need to do is buy a couple of leads, each with a phono jack at both ends, and connect the left and right phono sockets on the computer to the corresponding sockets on the hi-fi. Tandy should be able to supply the necessary leads for a minimal sum.

Dear AUI

I was reading the January issue of your mag when I spotted a mistake in the Power Drift review. The bottom screenshot on page 67 is in fact not taken from Power Drift, but Super Hang-On. This is obvious to anyone with half a brain, because instead of a buggy, in the centre of the screen is the bike from that game. Get it right next time!

Yours sincerely,

Michael Yates, Salisbury.

Dear Michael,

In fact it is you who are wrong. The screenshot is from Power Drift. Coming first in every race brings on a bonus race, in which you take control of either the Super Hang-On bike, or the plane from Afterburner. Anyway, since when has Super Hang-On featured buggies and a track made of logs? No hard feelings, and we hope you find the other half of your brain soon.

Dear AUI,

I've been reading Amiga User International for nearly three years (even when it was called Commodore Business and Amiga User!) and I bought an Amiga 1000 when they were first in the U.K. So I know what I'm talking about when I say the Amiga is a great computer. But now it seems to me that it is being devalued into just a games machine and I may not be very popular by saying this but I think lots of those who have bought the Amiga recently should have stuck to the Nintendo or Sega games consoles, or even the Atari ST. All they seem to care about is sitting square-eyed in front of some shoot 'em up.

I think Commodore went wrong in selling the Amiga too cheaply (I paid nearly £1,500 for mine!!) and to the wrong people. They should have concentrated on serious users or programmers.

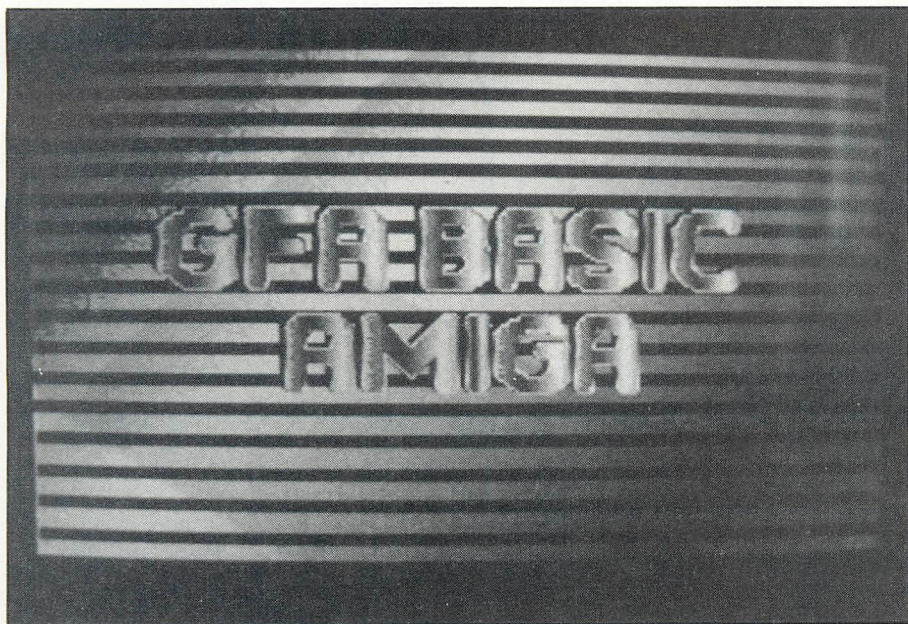
I like your magazine but I think it is not serious enough and you should forget the games scene which I think is mostly for kids in their early teens. Let beginners go and read other magazines and concentrate on the experienced and expert user.

Roger Fulford, Totteridge, London.

Dear Roger,

A lot of recent buyers might not entirely agree with you. We try to keep a balance between material for all interests on the Amiga - from beginners to experienced. But you don't devalue a computer by making it accessible to more people and is the games scene just for "teenager kids". Anyone disagree?

If you want to write to A.U.I., the address is: Amiga Answers, Croftward Publications, 40 Bowling Green Lane, London EC1R 0NE.



AmigaBASIC Is Dead,

Long Live BASIC!

Mark Smiddy test an outstanding new implementation of BASIC that could be good enough to threaten conventional high-level languages...

Without launching into a complete history lesson about BASIC, this affords me an opportunity, to say a few words to C and Assembler converts. There is nothing fundamentally wrong with BASIC provided:

- 1) The implementation supports the machine it was designed for.
- 2) It runs at a reasonable speed.

I am not about to suggest BASIC is the perfect language and should be the only one in existence, but if you adopt a thoughtful and eclectic approach, it does have its uses.

Face facts, BASIC is simple to learn and can be quick for the development of programs. Although simpler (usually older) incarnations can encourage sloppy programming, more recent attempts - following the example of Acorn's BBC BASIC - have improved the language almost beyond recognition. GFA BASIC 3.0 - the subject of this review - is just such a BASIC and can legitimately claim to be the most powerful BASIC for the Amiga today.

When the language was first introduced for the ST, it sold extremely well and almost became the machine's

standard - after the original ST BASIC was dropped. In the event, HiSoft BASIC won the "bundle battle" but GFA BASIC continued to sell - which demonstrates its apparent superiority. When the first versions for the Amiga appeared, people were disappointed to discover it was very badly bugged. These things tend to be hard to forget, but, I can now report all known problems have been sorted out and the language is being re-released with the option of a separate integrated compiler.

"None of the software is protected in any way so you can - as suggested - backup your disks first."

GFA BASIC is supplied on one disk with a daunting manual of biblical proportions. The disk contains the editor/interpreter, some examples and a run-only version of the interpreter. The run-only interpreter is placed in the public domain so you can freely distribute programs written in GFA without paying any licence fee to GFA. Nevertheless, they do request - not unreasonably - you state somewhere with what the program was written. Much the same agreement applies to the separate compiler software. I would encourage you to follow this guideline; there is no need to be embarrassed about BASIC, it is the end result that counts.

The editor can be started from Workbench or CLI in the usual way - though a Workbench disk is not supplied. One small cavil, the software cannot easily be copied to a hard disk and run from Workbench since the icons are configured to run from the GFA BASIC system disk. None of the software is protected in any way so you can - as suggested - backup your disks first.

Once inside the editor you are presented with a bewildering title menu with 20 options directly available plus a clock. A complex set of cursor commands - many reminiscent of WordStar - control movement within the text. Even though some combinations involve the numeric keypad, they are logical enough to be quickly learnt, however. One problem with the otherwise largely excellent manual surfaced here, beginners may find trouble locating some of the keys. For instance a reference was made to NUMLOCK before explaining it resides on the numeric keypad's "I".

The next shock for dedicated C64 and AmigaBASIC programmers is likely to be the complete lack of line numbers! Line numbers have been outlawed now because they confuse programmers

continued on page 32

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and encourage messy programming through slaphappy use of unconditional jumps (GOTOs). The GOTO command has not been removed from GFA, merely modified to use labels. Even though, in a BASIC as powerful as GFA undoubtedly is, there is no excuse to use them - GOTOs are supplied for those who insist they need it.

"GFA is not a mere conversion from another machine - it is a complete Amiga specific language in its own right."

Depending on your point of view it gets worse or better from now on. GFA's custom editor has several neat tricks up its interpreter. More shocks: in the editor, multi-statement lines have been eliminated; structures are indented automatically; and commands are converted to upper case - variables to lower. Syntax is checked at the same time. My opinion is these changes help ensure better, clearer programs anyone can follow. This defies what has always been said by programmers of "in" languages like C, who insist their code is self-documenting and BASIC programs resemble spiders webs. This has the upshot of helping everyone to write better - and more efficient code.

Another superb - unique in so far as I am aware - feature of GFA is its ability to "compress" procedures into one line. Procedures, for the uninitiated, are a feature (not unlike a sub-routine) borrowed from PASCAL. The beauty of procedures is they can be named and sent parameters just like other BASIC functions. The compress feature displays just the procedure "head", ignoring the code it contains. This makes programs very simple to read, for instance:

PROCEDURE blurb

```
x=1
FOR n=0 TO 1000
  PRINT n,x
  IF n>499 THEN x=x+1
NEXT n
RETURN
```

compresses to:

PROCEDURE blurb

Once each procedure has been tested it can be compressed. In this way the code you see on screen remains very small. A massive program could feasibly compress down to just a few lines.

Another great feature of GFA is its ability to check the general integrity of

all a program's loop structures without ever having to run it. This may seem a strange feature at first, but a large program could have hundreds of loops, some nesting very deeply. If a program was performing a ray-trace for instance and one of the loops failed. . . Bugs of this type are often very tricky to discover and this facility is very good at finding them.

As BASICs go, GFA has a wealth of commands - some of which would seem more at home in more advanced (?) languages. However, even with this vast range of options, the interpreter manages quite incredible speeds and is just 125K long. The question hanging over GFA nonetheless is: how well does it interface with the Amiga? The word remarkably springs to mind. GFA is not a mere conversion from another machine - it is a complete Amiga specific language in its own right. This, you may recall is the worst feature of AmigaBASIC - it is too "standard" to be much use - apart from being so dreadfully slow.

GFA BASIC for the first time, supports the complete Amiga operating system including Exec, Intuition and all those other calls required to make programs look professional. In theory at least, this means it should be possible to write almost any application currently requiring say, C, in GFA. In practice, the die-hards will probably stick to what they (we) know best. But this does mean BASIC programmers will be able to produce good quality applications; and do so in a fraction of the time - even Workbench applications.

"Using the compiler is a breeze since it comes ready supplied with a graphical 'shell'. All you do is select the GFA BASIC file to compile from a file selector and hit the compile button."

I should point out, the manual does not give a large amount of coverage to the Operating System, listing under the section for advanced programmers. The reader is encouraged therefore, to consult the appropriate official documentation. Also, although BASIC commands are protected from the GURU, the operating system calls are not - which is not practical as it turns out. That said, it is much simpler to call the system libraries from GFA BASIC than from any other language currently available.

As I have already said, GFA BASIC is fast. In fact, it is currently the fastest

interpreted BASIC on the Amiga - but still lags well behind a comparable program written in C or Assembler. It is slower that is until you feed some raw code to the compiler - available at extra cost, but almost essential. The compiler converts your program into a crude machine code version. I say crude because no compiler is smart enough to convert BASIC into optimised machine code, all the same, compiled GFA goes like the proverbial wind. And given the language's ability to handle sprites and BOBS it is not inconceivable a simple arcade game could be written in GFA.

Using the compiler is a breeze since it comes ready supplied with a graphical "shell." All you do is select the GFA BASIC file to compile from a file selector and hit the compile button. Compilation and linking is performed automatically, and usually, very quickly. There are quite a few options available from within the shell but in case the one you need is not, you can modify the source - which is included with the package.

Like the rest of the documentation, the compiler's manual is exemplary - allowing for the fact it was written in German and then translated. A large section towards the back is dedicated to optimising BASIC code. The examples are given BASIC with the compiled code (in assembler) to show how the optimisation works. Thankfully, they are obvious enough so even those unfamiliar with 68000 should have no difficulty following them.

To cover GFA BASIC completely in this short space would be to do its author an injustice. Quite simply it is the best BASIC I have ever seen for the Amiga and just keeps getting better. Version 3.5 is expected later in the year, with around 50 extra commands including matrix arithmetic! As it stands the language already supplies both quick and shell sorts, as well as dozens of other commands programmers usually supply as subroutines. Meanwhile, Mandarin are still trying to supply a finished version of AMOS which sounds good - but will have to go some to be the all-rounder GFA already is.

M.S.

GFA BASIC has created its own user group (see below) who are available for all registered users. According to Les Player of GFA they are the essential library for GFA BASIC.

Product: GFA BASIC 3. Price: BASIC £59.95, Compiler £29.95. Contact: GFA Data Media (UK) Ltd, Box 121, Wokingham, Berkshire, RG11 9LP. Tel: 0734 794941.

Help and advice: GFA User Group, 186 Holland Street, Crewe, Cheshire, CW1 3SJ. Tel: 0270 256429 (6pm - 9pm only)

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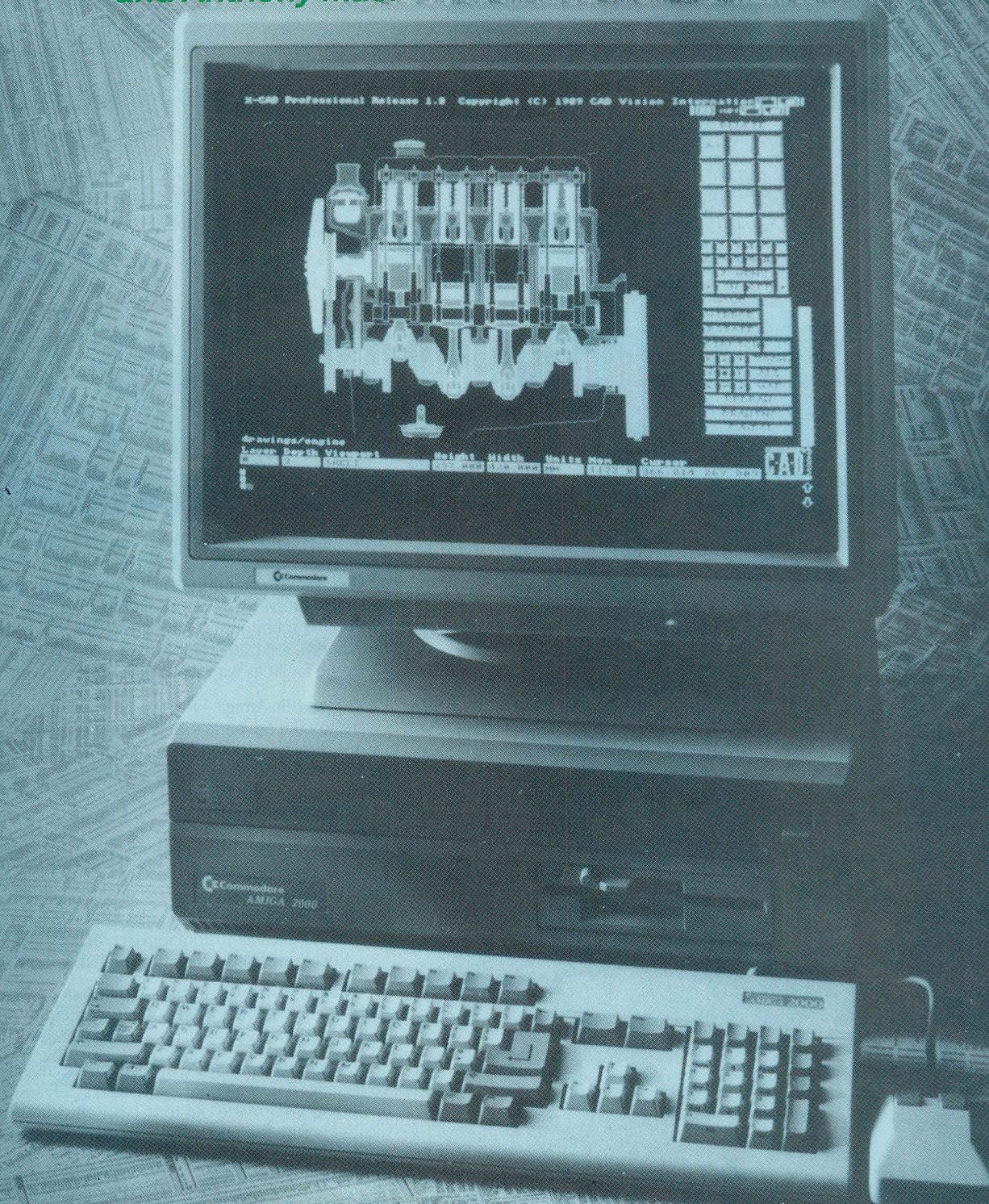
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*Compiled by Richard Franklin with assistance
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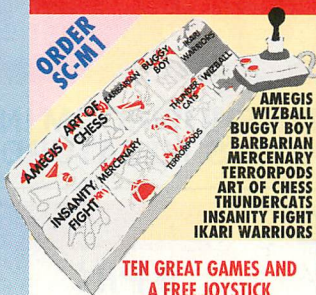
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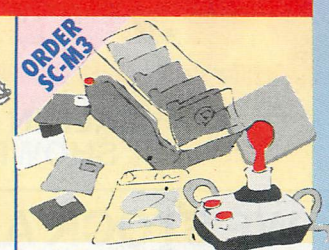
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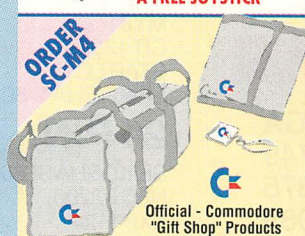
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PAL - PAL is the name given to the European standard for television. This differs from the American NTSC in having 56 more vertical lines. The framerate of PAL is also 50Hz as opposed to NTSC's 60.

PALETTE - The palette is an area holding the current colour definitions. This is similar to an artists palette where the painter is able to mix a colour from a group of colours. On the Amiga, these colours can be created by mixing the Red, Green, and Blue parts together in 4096 combinations.

PARALLEL - Parallel is a form of data transmission most commonly associated with the Centronics interface. Parallel data transmission is executed when all eight bits of a byte (character) are sent separately - but simultaneously - along eight different wires or communication channels. This is in contrast to Serial where each bit is sent consecutively on a single line. Parallel is usually less prone to errors but impractical for use over long distances.

PASCAL - Pascal is a structured programming language invented by Nicholas Wirth. It was very popular at the beginning of the eighties, but has been superseded by 'C' as the main structured language.

PROCESS - A process is the equivalent of a program on more basic machines. Any process can have more than one task associated within it. Synchronous processes attach to CLI's - ASynchronous processes are created with the RUN command.

PROCESSOR - The processor, sometimes called the CPU (Central Processing Unit) or a "computer on a chip", is the heart and the brain of the machine. The processor interprets executes instructions stored in the machines memory at the lowest level of operation.

PROPORTIONAL - This is a gadget type that allows the user to select a value by moving an image within a fixed area. The image can be locked horizontally or vertically, or free to move in both directions (like the screen positioning gadget on preferences).

PUBLIC DOMAIN - The public domain is where computer users can obtain programs written by other users which are made freely available. The system is such that the person distributing the public domain programs in principle only charges enough to cover the cost of the duplication and disks. This means that you can obtain a disk full of useful programs (some of commercial quality) for around £3.00.

RAM - an acronym for Random Access Memory is the area of memory where programs loaded from disk or other media are kept. Values held in RAM are lost when power is removed.

RASTPORT - A Rastport is a data structure which holds the information required for the graphics routines to draw into a window. It holds the information about where in memory to draw, drawing mode, current colour, drawing position, and so on.

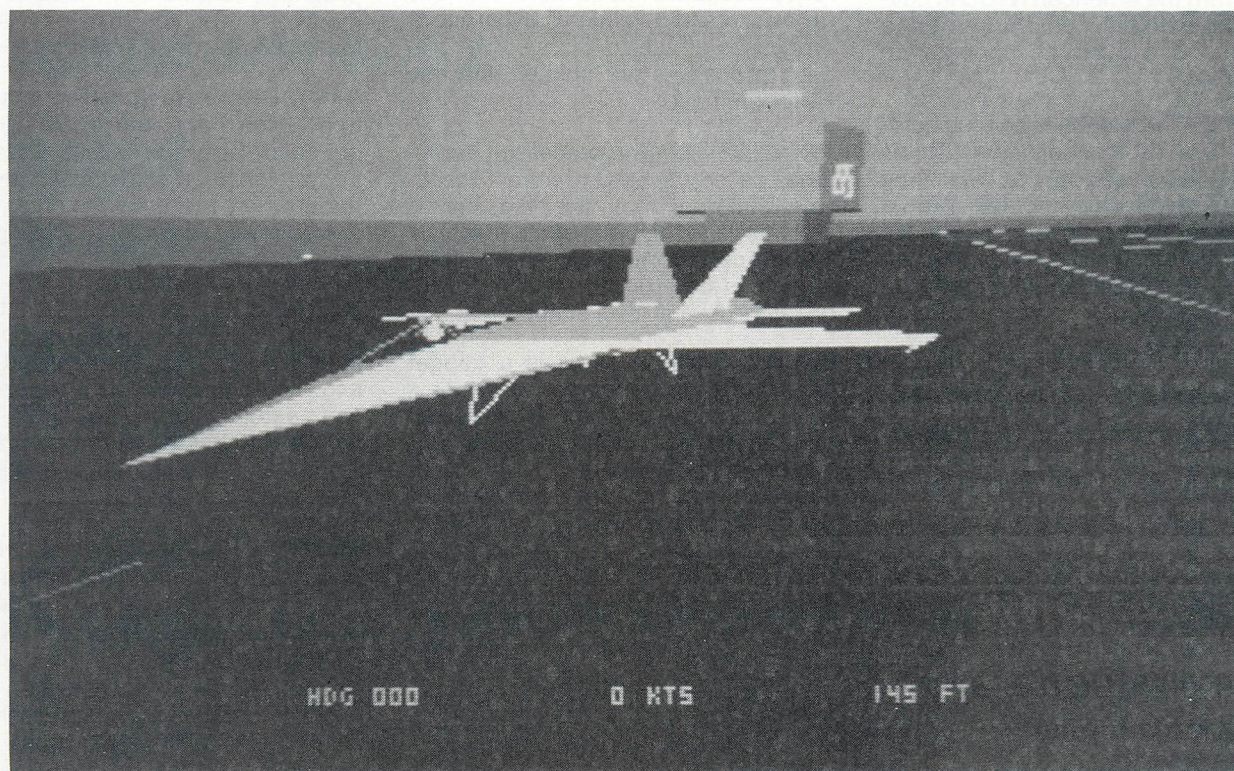
REFRESH - A refresh is when part of the screen has to be re-drawn because another window has been moved over it and destroyed its contents. This refresh can be done automatically (with memory overheads), or by the program by responding to Intuition's refresh request.

REQUESTER - A requester is a window where the user can interact with a program. Requesters can be generated either by programs or the system. Thanks to the Amiga's powerful messaging system, requesters can automatically wait for one or more events - a disk being inserted for example.

RESOLUTION - The resolution of the display directly controls how many pixels can be displayed on the screen. The



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Amiga has four basic resolutions - two horizontal and two vertical - plus some custom displays formed by "overscanning" the borders.

RJ MICAL - RJ MICAL was one of the original designers of the AMIGA Computer, closely involved personally and in the management and creation of the operating system.

ROM - is an area of memory that has pre-defined program or data stored in it. The information cannot be altered, thus, Read Only Memory.

SECTOR - A sector is the smallest amount of data AmigaDOS will read or write. Under AmigaDOS a sector consists of 512 bytes and all files are written with padding blanks to fill up an exact number of 512 byte sectors. Comparatively, the C64 has a sector size of 256 bytes.

SERIAL - Serial is a term which means one by one, i.e. consecutive. This is most often used in describing the RS232 data transmission method where each bit of a byte is sent, one after the other, along the same wire. Each bit is left on the line for a set period of time defined by the baud rate.

SHELL - A Shell is an environment created by a programmer to allow basic

operations on their program. The workbench and CLI are examples of shells.

SIMULATIONS - Are games which attempt to emulate the performance of a certain vehicle (Car or Plane) with you at the controls. Simulation is now also used for games such as Golf and Football. Originally created for the training of aircrew and other technical staff, it offers a cost-efficient method of providing "real" experience of complex tasks. Amiga's are now being used to train air traffic controllers at U.K. airports.

SPREADSHEET - A Spreadsheet is a program which allows the user to manipulate numbers set up in a table. Each 'CELL' of the table can contain a number, text, or a mathematical formula which results in a value calculated from the values in other cells. Often described as "the management's what if?" tool. It allows the user to alter one value with the program automatically adjusting all others to accommodate the change.

SPRITE - A Sprite is a graphical image that can be placed or moved anywhere within the display area; they can be produced in hardware or software. Hardware sprites do not appear in RAM although they are limited to just 16 pixels wide and 4 or 16 colours. Software sprites, on the other hand, are written

into the display RAM and thus need some method of preserving the original display. However, they can be any size and use up to 64 colours - 4096 with clever programming. The concept of hardware sprites was developed by Jay Miner.

STRING GADGET - This is one of the simplest gadget types, which allows the user to enter a line of text. The line can be longer than the entry window and is scrolled left and right automatically.

SUPER BITMAP - This is a display mode for a window where the program supplies its own area for the display information and only the area of the window that is uncovered is displayed. This is ideal for scrolling a pre-drawn display as you just plot the complete display on a larger 'screen' and just change the position from which to display to cause the scroll.

TASK - A Task is a program module which appears to be in complete control of the machine. This is done by the processor on a timed event which allows it to allot an amount of time to each task, saving all details of that task's status before switching to the next. Obviously, when there are a number of tasks running, the machine appears to slow down as it takes a longer time to

service all tasks and get back to the one you are using.

TITLE BAR - The title bar is the area at the top of the screen or window that contains the name of the program running it and/or any other information the programmer wants displayed there.

TOPAZ - The default system font which is either 80 columns wide by 8 lines high (Topaz 80), 64 columns wide by 19 lines high (Topaz 60), or 80 columns wide by 11 lines high (for interlace displays).

TRACK - A computer disk is separated into tracks onto which the data is written. Each track is one complete circle of the disk. An AMIGA 3

1/2" disk has 80 tracks on each side and each track can hold 11 sectors. The C64 5 1/4" disk has 35 tracks and a varying number of sectors.

TURBO - is a term used for devices that speed up the operation of the computer. This can be an actual physical device such as a faster processor, or software which operates at a faster rate (cassette turbo loaders on the C64 will load specially saved data up to 10 times faster than the normal method).

UART - Universal Asynchronous Receiver/Transmitter is another name

for the hardware that controls the RS232 serial data transfer. The C64/VIC-20 have software that emulates a UART device that was planned to be fitted but never appeared.

VIEW - A View is a data structure which is used to create what you see on the screen. It combines all of the different Viewports (see below) which are currently visible into one display. This allows for the dragging of one screen over another.

VIEWPORT - The Viewport is the data structure which incorporates the main screen display memory with any super bit-map areas into the actual displayed screen.

WILDCARD - A wildcard is a string that is used to match a number of other strings, mainly in the use of filenames. On the Amiga, filename wildcards are: '?' match any single character, '#' match any number of the following character. So '#?' will match any number of anything. This is the equivalent of '*' in MD-DOS and other more standard filing systems.

WINDOW - This is the rectangular area on the screen where all intuition information can go. All Intuition programs require a window to work on even if that window is not apparent. The work-

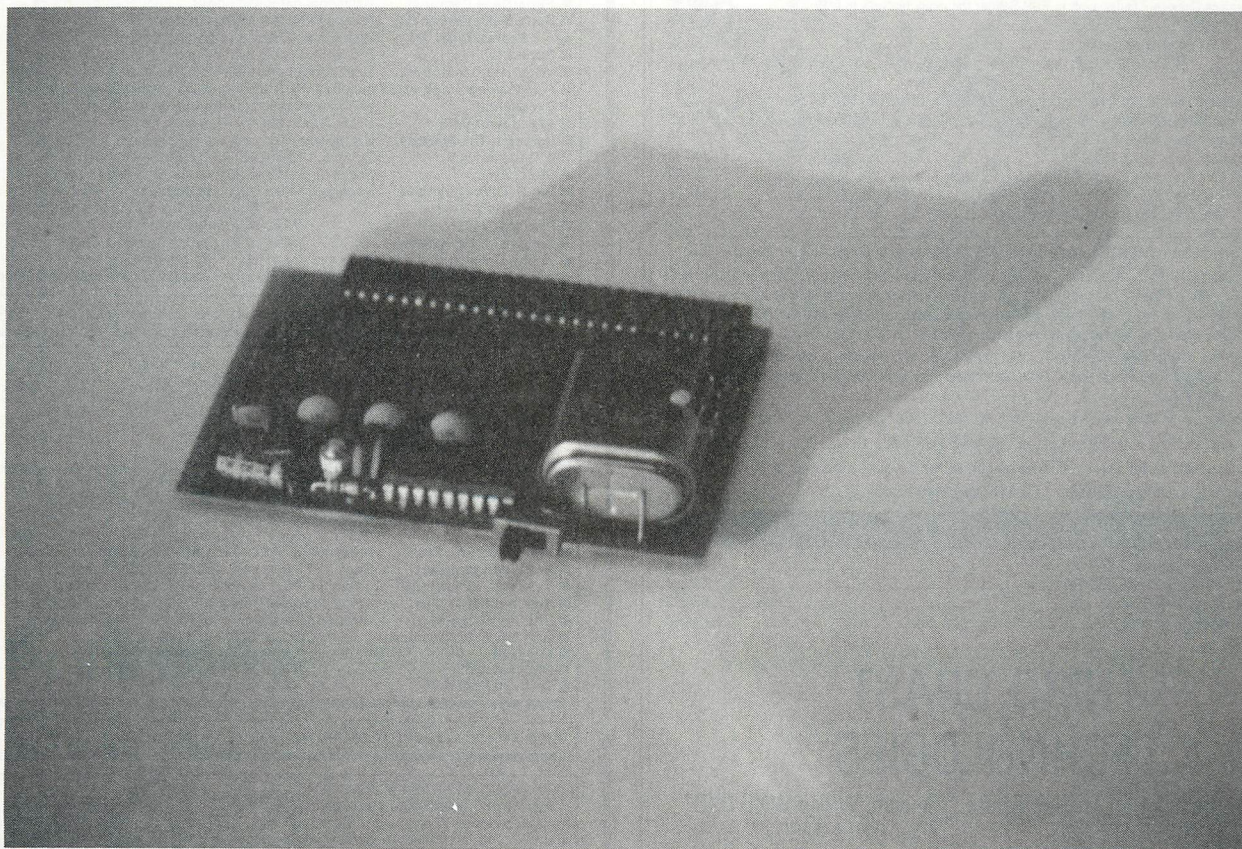
bench screen has one such window which covers the whole area of the screen.

WORD - Assembly language syntax for 16 bits or two bytes of data.

WORD PROCESSOR - Originally on expensive stand alone computers, now wordprocessors are software packages to run on all computer formats. A Word-Processor package lets the user write letters etc. without the need for a typewriter. It is more efficient in use than a typewriter as errors can be corrected on the computer before they are transferred to paper, and a great deal of formatting can be done to the text which will appear on the screen so the results can be seen.

WORKBENCH - is the equivalent of GEM's Desktop where the user can interact with AmigaDOS. It is not essential, but unless you are a CLI freak and need the extra memory, it is useful to have loaded.

WYSIWYG - Pronounced "wizzywig", stands for What You See Is What You Get and generally applies to word processing packages. It means exactly what it says - what you see on the screen is what you'll get when you print it out. This is a positive advantage as it allows you to do any formatting and preparation of text etc. on screen, knowing that is exactly what will appear on paper.



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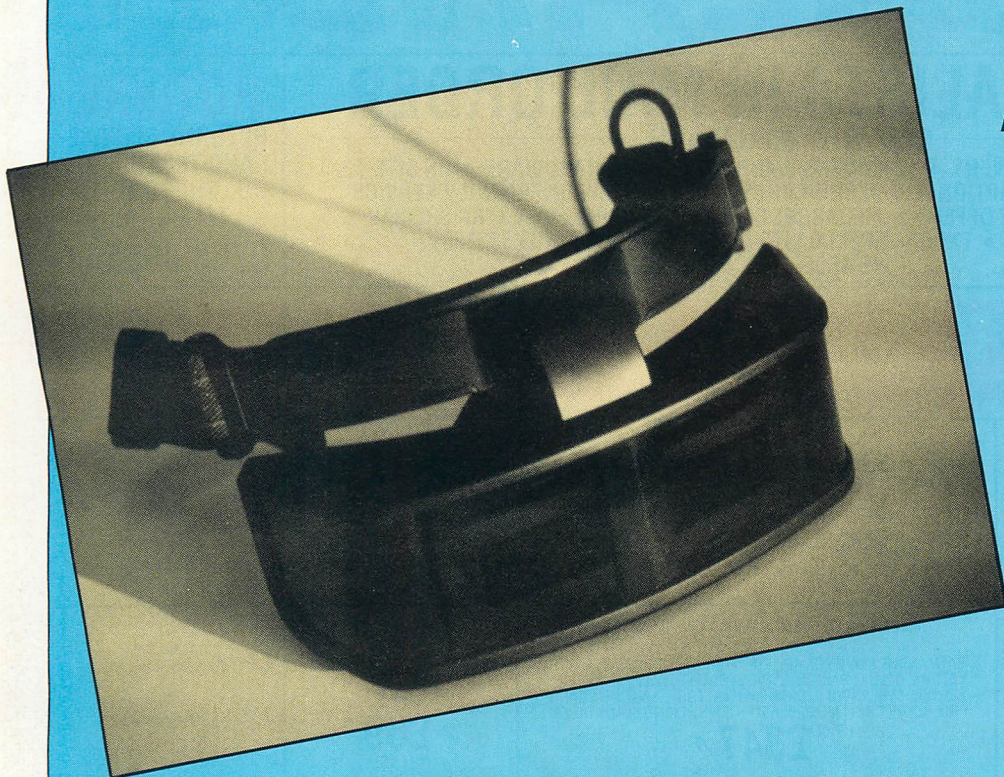
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"As the cubes come out of the screen, they really do look real, to an extent that it is spooky when you reach out to touch them and find nothing but air!"

they really do look real, to an extent that it is spooky when you reach out to touch them and find nothing but air!

The Make 3D program included on the disk allows you to use just about any existing 3D CAD, sculpt, digitising or ray tracing program with the glasses. To create a stereo picture, you need two versions of the same scene, viewed from slightly different points. In the case of a digitised picture, that would mean moving the camera to one side before digitising the second image. The same method would be used with a 3D modelling program, only this time moving the imaginary camera.

X-Specs 3D

Is Tony Horgan real? On this page he is only 2 dimensional but photograph him, digitise the picture, take it in as an IFF file and stare at it through X-Specs and you have a whole new dimension of Horganics...

Ever wished your 3D games actually came out of the screen at you, or your ray traced sculptures had true depth? With X-Specs 3D, you need wish no longer.

For £99.99, you get a hardware and software package consisting of a pair of 3D glasses and a disk of assorted 3D programs. The glasses work in the same way as those Sega make for their Master System console. As you probably know, 3D vision is the result of the slightly differing views you get from each eye. The X-Specs software takes advantage of this, by displaying two images for every one 3D image. The liquid crystal lenses in the glasses rapidly black out one eye and then the other. This is synchronised with the two images on screen, which never actually appear at the same time. This ensures

you see the right hand image with your right eye, and vice versa. Because of the way the system works, a machine with a flicker fixer installed would not be compatible.

The software includes a game, a 3D slideshow, some animated vector models of various molecules, and a utility for displaying your own 3D pictures. Space Spuds, the game, is a wacky space shoot 'em up. Your laser fire is centred on approaching potatoes, which are followed in later levels by bags of chips and hamburgers. It is not going to win any awards, but is fast enough to be a good bit of fun in the short term. The slideshow is a demo of what can be done with digitised and computer-generated pictures. The cube demo is one of the most convincing on the disk. As the cubes come out of the screen,

If you wanted to make up your own 3D drawing, you can do that too. Objects you want to appear in front of the screen need to be offset in one direction, with distant objects in the opposite direction. I tried this with a screen from Chase HQ, grabbed into IFF format and loaded into Deluxe Paint. The effect is pleasing, and shows what could be done if the game had been programmed for use with the specs.

There is a lot of potential for 3D games with the X-Specs. However, so far there is only Space Spuds to keep you occupied, so I cannot recommend the specs for gamers until there is more support. Anyone using their Amiga for 3D CAD and the like does not have that problem. The advantages of true 3D games are obvious, as programmers are always trying to increase their games' realism. When it comes to serious applications, other than the novelty value, I cannot see the advantage of viewing a still 3D scene with the glasses, when it would be completely clear and understandable in the usual psuedo 3D output from your monitor. All the same, if you want to add a bit of sparkle to your presentations, X-Specs 3D are just the ticket.

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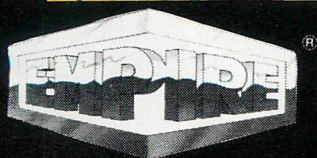
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```

struct Border DrawerBrd = {-1,-1, BLACK, NULL, JAM1, 5, Line11, NULL};
struct Border PropBrd = {-1,-1, BLACK, NULL, JAM1, 5, Line12, NULL};

UBYTE DBuffer [BUFFSIZE], UndoBuffer [BUFFSIZE], FBuffer [BUFFSIZE];
struct StringInfo DrawerInfo = {
    DBuffer, UndoBuffer, NULL, BUFFSIZE, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0};
struct StringInfo FileInfo = {
    FBuffer, UndoBuffer, NULL, BUFFSIZE, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0};
struct PropInfo PropInfo = {
    AUTOKNOB | FREEVERT, NULL, 0x0000, NULL, 0xffff, 0,0,0,0,0,0};

struct Gadget PropGadget = {
    NULL, 179, 50, 20, 140, GADGHNONE, RELVERIFY, PROPGADGET | REQADGET,
    (APTR) &PropBrd, NULL, NULL, NULL, (APTR) &PropInfo, PROPID, NULL};

struct Gadget FileGadgets [NUMFILES]; /* Array of gadgets for file names */
struct IntuiText FileTexts [NUMFILES]; /* Another array for their texts */

struct Gadget Cancel = {
    &PropGadget, 170, 196, 57, 13,
    GADGHCOMP, RELVERIFY | ENDGADGET, BOOLGADGET | REQADGET, NULL, NULL,
    &CancelText, NULL, NULL, CANCEL, NULL};
struct Gadget Load = {
    &Cancel, 30, 196, 43, 13,
    GADGHCOMP, RELVERIFY | ENDGADGET, BOOLGADGET | REQADGET, NULL, NULL,
    &LoadText, NULL, NULL, LOAD, NULL};
struct Gadget Hard = {
    &Load, 217, 61, 42, 11,
    GADGHCOMP, RELVERIFY, BOOLGADGET | REQADGET, NULL, NULL,
    &HardText, NULL, NULL, HARD, NULL};
struct Gadget Flop = {

```



```

    &Hard, 217, 81, 42, 11,
    GADGHCOMP, RELVERIFY, BOOLGADGET : REQADGET, NULL, NULL,
    &FlopText, NULL, NULL, FLOP, NULL};
struct Gadget Ram = {
    &Flop, 217, 99, 42, 11,
    GADGHCOMP, RELVERIFY, BOOLGADGET : REQADGET, NULL, NULL,
    &RamText, NULL, NULL, RAM, NULL};
struct Gadget Parent = {
    &Ram, 209, 117, 51, 11,
    GADGHCOMP, RELVERIFY, BOOLGADGET : REQADGET, NULL, NULL,
    &ParentText, NULL, NULL, PARENT, NULL};
struct Gadget ArrowUp = {
    &Parent, 200, 59, 11, 6,
    GADGHCOMP : GADGIMAGE, RELVERIFY, BOOLGADGET : REQADGET,
    (APTR) &ArrowUpIm, NULL, NULL, NULL, NULL, HARDUP, NULL};
struct Gadget ArrowDn = {
    &ArrowUp, 200, 67, 11, 6,
    GADGHCOMP : GADGIMAGE, RELVERIFY, BOOLGADGET : REQADGET,
    (APTR) &ArrowDnIm, NULL, NULL, NULL, NULL, HARDDN, NULL};
struct Gadget ArrowUp2 = {
    &ArrowDn, 200, 80, 11, 6,
    GADGHCOMP : GADGIMAGE, RELVERIFY, BOOLGADGET : REQADGET,
    (APTR) &ArrowUpIm, NULL, NULL, NULL, NULL, FLOPUP, NULL};
struct Gadget ArrowDn2 = {
    &ArrowUp2, 200, 88, 11, 6,
    GADGHCOMP : GADGIMAGE, RELVERIFY, BOOLGADGET : REQADGET,
    (APTR) &ArrowDnIm, NULL, NULL, NULL, NULL, FLOPDN, NULL};
struct Gadget Drawer = {
    &ArrowDn2, 69, 19, 183, 10,
    GADGHCOMP, RELVERIFY, STRGADGET : REQADGET, (APTR) &DrawerBrd,
    NULL, NULL, NULL, (APTR) &DrawerInfo, DRAWER, NULL};
struct Gadget File = {
    &Drawer, 69, 39, 183, 10,
    GADGHCOMP, RELVERIFY, STRGADGET : REQADGET, (APTR) &DrawerBrd,
    NULL, NULL, NULL, (APTR) &FileInfo, FILE, NULL};

struct Requester Requester = {
    NULL, 179, 18, REQWIDTH, REQHEIGHT, NULL, NULL, &FileGadgets[0], Brd,
    &ReqText, NULL, WHITE, NULL, NULL, NULL, NULL, NULL};

struct NewWindow NewWindow = {
    1, 1, 638, 250, 0, 1, CLOSEWINDOW : GADGETUP,
    WINDOWCLOSE : SMART_REFRESH : ACTIVATE : WINDOWIZING :
    WINDOWDRAG : WINDOWDEPTH : NOCAREREFRESH,
    NULL, NULL, "Think big...HELLO UNIVERSE",
    NULL, NULL, 630, 240, 640, 250, WBENCHSCREEN};

void main(), doIDCMP(), OpenStuff(), CloseStuff(), SetFileGadgets(),
doGadgets(), doRead(), ReBuildFiles();
extern void strcpy(), strcat();
extern int strlen();
char slash = '/';

char FileName [300]; /* These hold lists of filenames. */
char FileList [MAXFILES][31]; /* Let's get these statically sussed */
char ITexts [NUMFILES][MAXLENGTH]; /* so we know where we are later on */
/* Strings for the ITexts */

USHORT Count; /* Keeps track of number of files in memory */

void main(){
void main(){
    OpenStuff();
    DBuffer [0] = UndoBuffer [0] = FBuffer [0] = '\0'; /* Zero buffers*/
    SetFileGadgets (); /* Dynamically set an array. Rebellious or what? */

```


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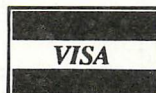
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Welcome



continued from page 46

```

Request (&Requester, Window);
while (1){      /* It's a sad day when even 1 can't be relied on to be */
    doIDCMP (); /* TRUE */
}

void OpenStuff(){
    IntuitionBase = (struct IntuitionBase *)      /* These 2 lines are */
        OpenLibrary ("intuition.library", 0); /* one statement */
    if (IntuitionBase == NULL) exit (FALSE); /* Just checking */
    if ((Window = (struct Window *) OpenWindow (&NewWindow)) == NULL){
        CloseLibrary (IntuitionBase);
        exit (FALSE);
    }
    if ((FBlock = (struct FileInfoBlock *)
        AllocMem (FILE_SIZE, MEMF_PUBLIC)) == NULL) {
        CloseWindow (Window);
        CloseLibrary (IntuitionBase);
        exit (FALSE);
    }
}

void CloseStuff(){
    if (Window) CloseWindow (Window);
    if (IntuitionBase) CloseLibrary (IntuitionBase);
    FreeMem (FBlock, FILE_SIZE);
}

/* This routine builds up the 14 gadget structures for the file selection
   bit and also the appropriate IntuiTexts which would contain the
   file names in a go scenario */

void SetFileGadgets(){
    USHORT i;
    USHORT BaseX = 14;
    USHORT BaseY = 50;
    for (i=0; i<NUMFILES; i++){
        FileGadgets [i].NextGadget = &FileGadgets [i+1];
        FileGadgets [i].LeftEdge = BaseX;
        FileGadgets [i].TopEdge = BaseY;
        FileGadgets [i].Width = 162;
        FileGadgets [i].Height = 10;
        FileGadgets [i].Flags = GADGHCOMP;
        FileGadgets [i].Activation = RELVERIFY;
        FileGadgets [i].GadgetType = BOOLGADGET | REQADGET;
        FileGadgets [i].GadgetRender = NULL;
        FileGadgets [i].GadgetText = &FileTexts [i];
        FileGadgets [i].MutualExclude = NULL;
        FileGadgets [i].SpecialInfo = NULL;
        FileGadgets [i].GadgetID = SELECT_FILE;
        FileGadgets [i].UserData = NULL;

        FileTexts [i].FrontPen = ORANGE;
        FileTexts [i].BackPen = WHITE;
        FileTexts [i].DrawMode = JAM2;
        FileTexts [i].LeftEdge = FileTexts [i].TopEdge = 2;
        FileTexts [i].ITextFont = NULL;
        FileTexts [i].IText = &ITexts [i][0];
        FileTexts [i].NextText = NULL;
        strcpy (&ITexts [i][0], "          ");
        BaseY += 10;
    }
    FileGadgets [NUMFILES-1].NextGadget = &File;
}

```


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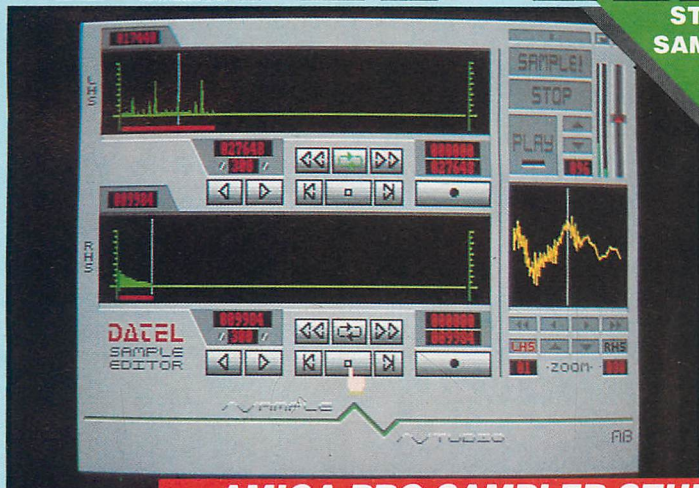
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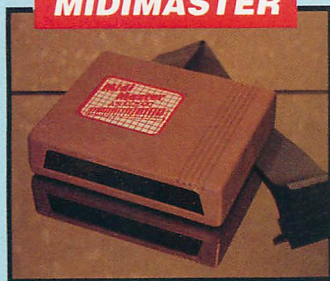


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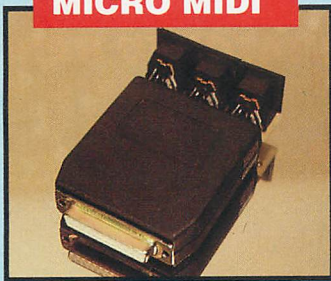
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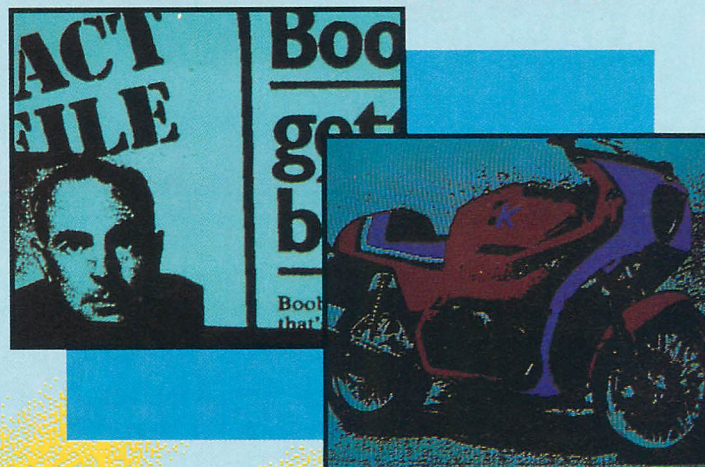
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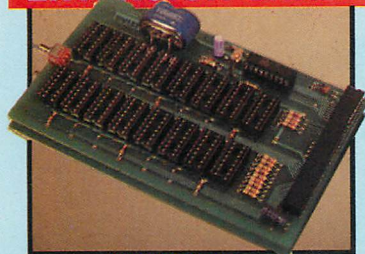
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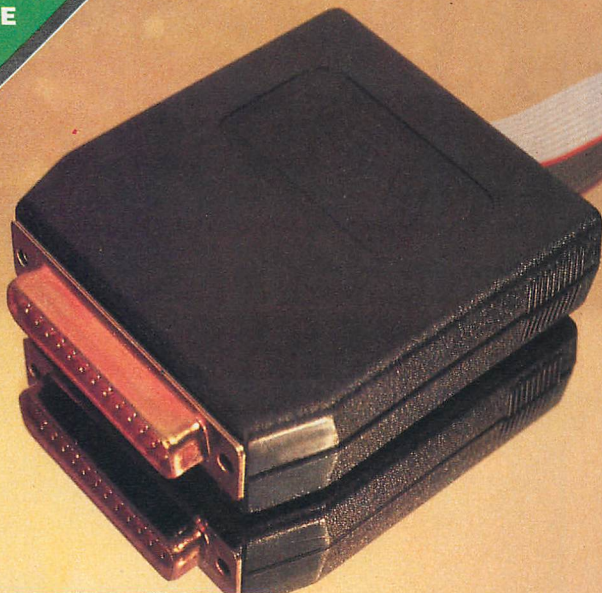
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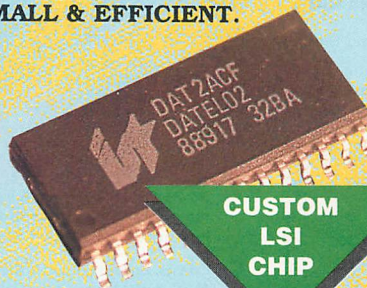
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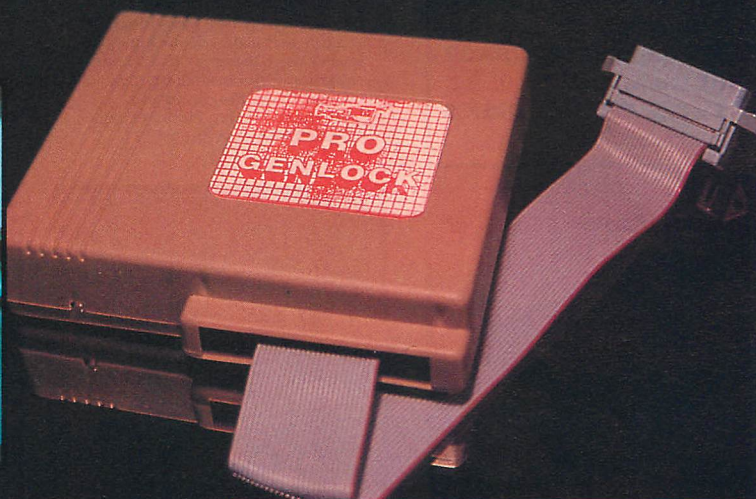
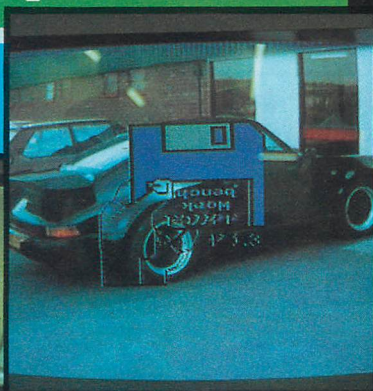
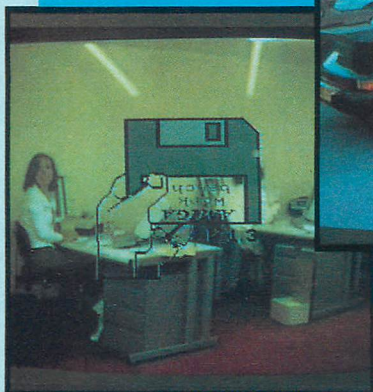
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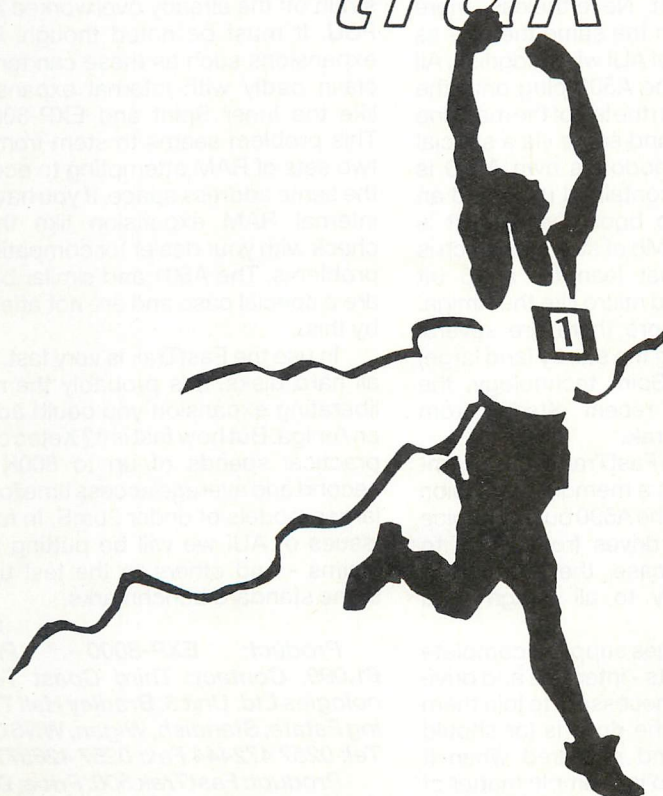
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Mark Smiddy looks at some expansion possibilities

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When the Amiga 500 was introduced it was regarded by some as a limited machine since it lacked the inward expansion of its larger brother the B2000. However, thanks to recent advances in technology, the price of RAM has dropped to the point where it is now possible for almost anyone to upgrade a basic machine; and more than the privileged few can expand to a full 9Mb. Also, due mainly to some remarkably ingenious Amiga hardware developers, the Amiga 500 can be used as a cost-effective PC too. This article is intended as an introduction to Amiga expansion and will examine some of the options available to the user wishing to extend their system. The systems listed here as examples represent a typical cross-section of the vast range available.

RAM Upgrades

When it comes to the crunch - the first question posed by those wishing to upgrade on a low budget is: should I get extra RAM or a second disk drive. My advice is to go for the RAM first and the drive next. The reason being, you can always use the RAM as a disk but not the other way around. Also, the Amiga functions much better with more memory and several (major) software titles refuse to run in less than 1Mb anyway. Deluxe Paint III is a typical example.

When shopping around for a RAM upgrade for an A500 you are likely to be surprised by the number of options now

available. The first is Commodore's A501 which, although possibly the most expensive of the 0.5Mb upgrades, remains one of the best. When referring to 0.5Mb upgrades I mean the type which fit in the niche under the machine - not the internal variety. There are two types - with and without real time clock (RTC) also called a battery-backed clock. The types without clock are usually around £10 cheaper but the saving is frequently a false economy. Under AmigaDOS all files are date-stamped - this means the time and date of creation is saved along with the file. Date stamping is very useful for discovering which version of, say, your latest program is most recent.

On the other hand, for those with a much bigger budget - there is the option of internal memory expansions - typically now for the A500 some of which can be expanded to a massive 8Mb. Add the 1/2Mb standard memory plus 1/2Mb fast RAM and the machine is now at its design limit; and all this inside the casing of an A500! Amazing as it may seem, these expansions are becoming quite common. One such board, which will make B2000 owners green with envy is the **EXP-8000+ Board** from Progressive Peripherals and Software.

The basic board is supplied either unpopulated (0Mb) or in steps of 2, 4 and 8Mb. Of course, even at today's prices 8Mb is not cheap. The complete expansion uses no less than sixty-four 1Mbit chips costing around £12 each. In addition you have the option of adding a 68010 and 68881 maths co-processor. In effect this board gives back to the A500 what Commodore left out when they scaled the price down.

Installing the board is very simple thanks to an excellent - if poorly produced - manual. Simple that is if you have some basic knowledge of electronics - if not this is a job best left to someone who does. Briefly, installing the board is performed by removing the Amiga's case, popping the 68000 out of its socket, installing the board in the vacated socket and finally plugging the 68000 back into the EXP-8000+. If you have opted for the maths co-processor, it is also necessary to install the required parts and attach a single jumper to Gary (the Amiga Gate ARaY custom chip). This is used for timing and not usually required.

Unlike some boards, the EXP-8000+ has some unusual features - for instance, allowing your choice of 68881 to be dictated by your budget. Basic systems can use the slowish 12Mhz version, better systems, 16Mhz; and for those intent on using Sculpt 4D a 25Mhz version - which is naturally expensive. Similarly, the board is fully compatible with most 1Mb DRAMs of 150ns or faster. I should point out though, faster RAM will not make any difference - it just costs more. Also, there is little point in

adding a 68881 unless your software supports it!

"The basic board is supplied either unpopulated (0Mb) or in steps of 2, 4 and 8Mb."

Using the EXP-8000+ is so simple it almost defies its high price. There is no software to run, just switch on and go. The sight of a fully expanded Amiga is staggering - matched only by its performance. With this amount of memory you stop worrying about the size of your RAM disk or how many tasks are running - just let the machine perform. You might ask yourself though, why do I need all that RAM? To start with there is RAD - the recoverable ramdrive this can become a fifth disk drive with a full 880k of free store formatted with fastfile system. On 1.3 Kickstart, the machine can be booted directly from RAD much faster than even a fast hard disk.

One small caveat: with this amount of RAM even though it is low power consumption, places an excessive load on the A500's power pack. If you intend using extra peripherals as well (including extra disk drives) the Commodore supplied PSU must be exchanged for a more robust version.

Hard Disks

It is easy for me to claim hard disks are very much of a muchness and I have already said about as much as can be said about them. Nevertheless, there are variations on the same theme - as regular readers of AUI will recognise. All hard disks for the A500 plug onto the expansion bus on the left of the machine - a few directly and some via a special interface. Commodore's own A590 is one of the self-contained units and an excellent buy to boot. Even so, it is limited to just 20Mb of storage, which is frankly somewhat lean for a 16 bit graphics oriented micro like the Amiga. Of the other genre there are several options including the sturdy (and large) HDA-506 from Spirit technology, the Vortex and the recent offering from Xetec, the **FastTrak**.

I shall use the FastTrak in this example since it offers a memory expansion option similar to the A590 but the choice of several hard drives from 20Mb to 150Mb. In any case, the information applies generally to all Amiga hard drives.

FastTrak comes supplied complete as two major parts - interface and drive plus the cabling necessary to join them together. Since the drive is (or should be) formatted and prepared when it arrives, setting up is a simple matter of plug it all together and away you go. If you have a recent Amiga with 1.3 Kick-

start it may be necessary to change one of the jumpers in the interface in order for the drive to auto-boot.

If the drive has not been set up correctly - or indeed at all - beginners especially may suffer some anxiety since the supplied installation software is something less than helpful. Manuals notwithstanding, most people should be able to muddle through eventually. If in any doubt ensure the drive is set up for you by your dealer or at least someone knowledgeable enough to do so. This is not true of Commodore's A590 which is supplied with some excellent installation software. Nevertheless, Xetec must be congratulated for supplying the essential hard drive backup utility with their system - something Commodore do not.

"The FastTrak... offers a memory expansion option similar to the a590 but the choice of several hard drives from 20Mb to 150Mb."

Like Commodore's A590, the Xetec system includes space in the SCSI interface for extra RAM - 4Mb instead of 2Mb - and an optional 68881 maths co-processor. If these extras are fitted the extra power required can be drawn directly from the hard drive, taking the strain off the already overworked A500 PSU. It must be noted though, RAM expansions such as these can tend to clash badly with internal expansions like the Inner Spirit and EXP-8000+. This problem seems to stem from the two sets of RAM attempting to occupy the same address space. If you have an internal RAM expansion like these, check with your dealer for compatibility problems. The A501 and similar board are a special case and are not affected by this.

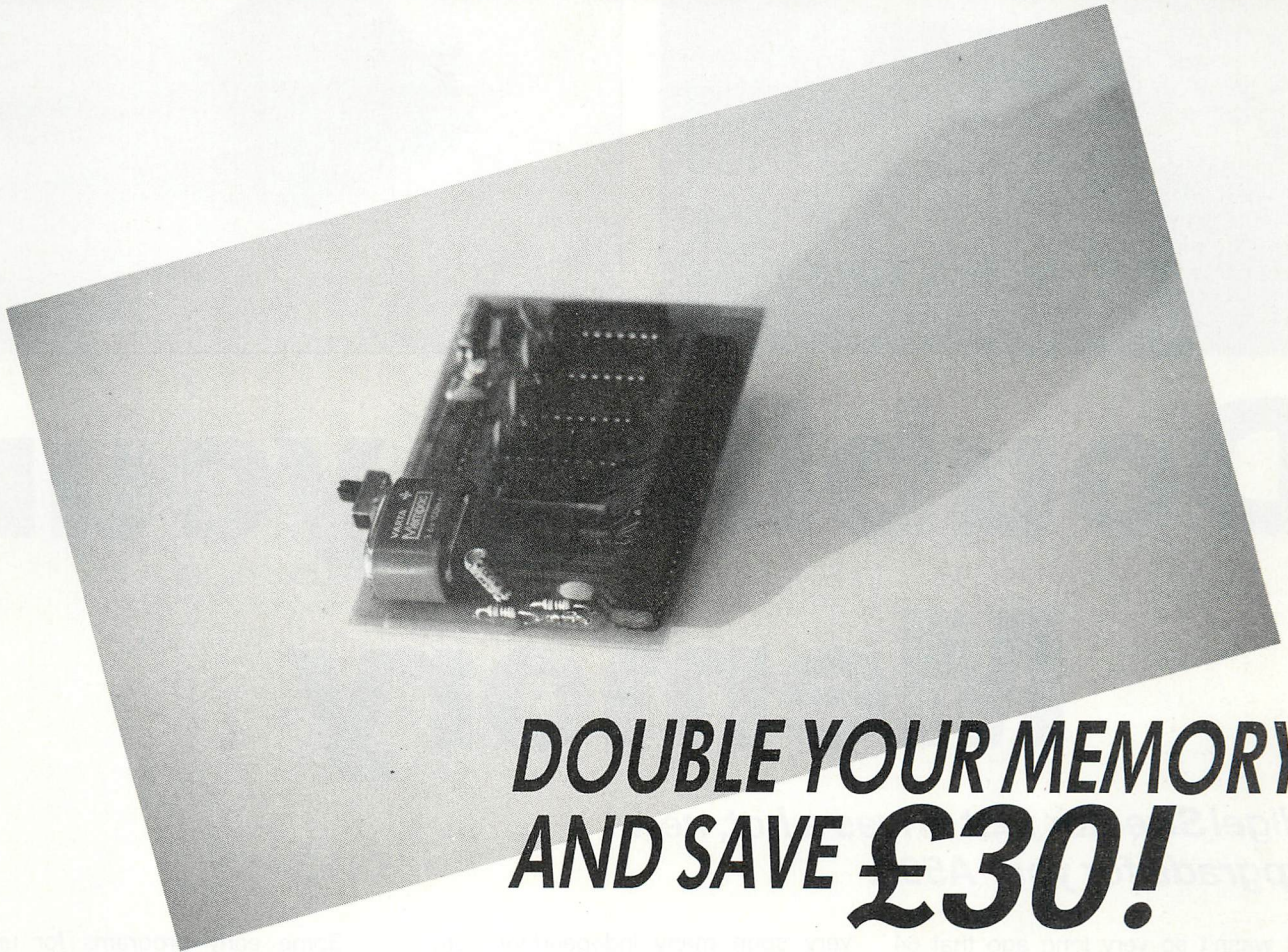
In use the FastTrak is very fast. Like all hard disks, it is probably the most liberating expansion you could add to an Amiga. But how fast is it? Xetec claim practical speeds of up to 800K per second and average access time for the larger models of under 20ms. In future issues of AUI we will be putting their claims - and others to the test using some standard benchmarks.

M.S.

Product: EXP-8000+. **Price:** £1,099. **Contact:** Third Coast Technologies Ltd. Unit 8, Bradley Hall Trading Estate, Standish, Wigan, WN6 0XQ. **Tel:** 0257 472444 **Fax:** 0257 426577

Product: FastTrak 500. **Price:** £649. **Contact:** Third Coast Technologies Ltd.

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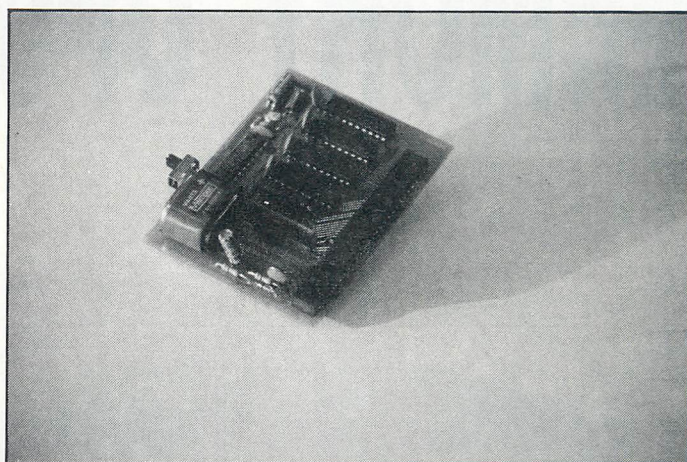
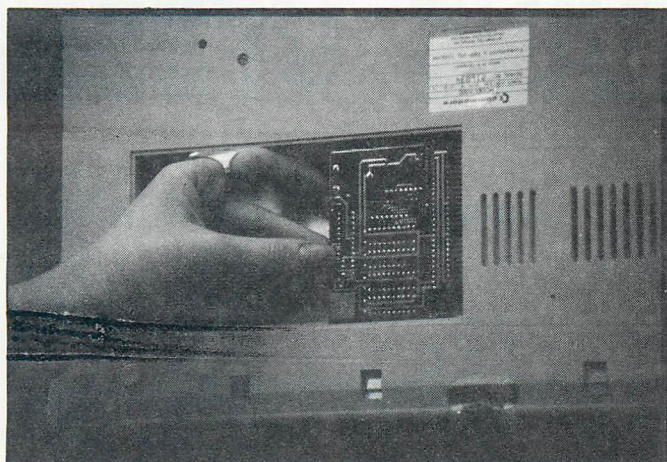
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Doubling your Memory

Nigel Streeter test drives a hot, new upgrade for your A500.

It wasn't so very long ago that 64 kilobytes of memory was considered to be a large area in which to program. Nowadays, 64K is beginning to be considered miniscule but software companies are still pushing the boundaries further than ever before.

When the Amiga 1000 was launched, with its "massive" 256K memory, we all wondered at the possibilities of so much RAM. Then came the amazing Amiga 500, delivering all that the A1000 promised, with double the memory. But, almost before the dust of eager computer buyers, rushing from shops clutching their new wonder machine under their arms, had settled, rumours were rife about amazing new games soon to be released. These were to have superlative graphics and sound, be of almost cartoon quality but would only run on an Amiga that had 1 MEGABYTE of memory!!

They came as Dragon's Lair, Dungeon Master and so on. However, not only games, many application programs appeared that, although they ran perfectly well within 512k, could only be fully utilised using machines with a larger memory.

The answer was obvious - a memory expansion board.

Commodore started the ball rolling with their A501 expansion board and

very soon many independent companies had their own versions, all using the expansion slot underneath the A500 that CBM had so thoughtfully provided. Some expansion boards also offered the added advantage of having a real-time, battery backed clock fitted.

The latest in a line of contenders to enter the marketplace is the AMC100. Measuring only 2.5 inches by 3.5 inches, it must surely be one of the smallest expansion boards available. Its lack of size has been made possible by remarkable leaps in chip technology, leading to the advent of the 1 megabit chip - requiring only four to make 512K.

"Measuring only 2.5 inches by 3.5 inches, it must surely be one of the smallest expansion boards available"

These new D-Rams are also exceptionally reliable and use very little power to operate.

The AMC100 is fitted with a real time clock that is kept functioning, when the machine is switched off, by an auto-recharging battery that should never need changing.

Some early programs for unexpanded 500s, particularly games, will not run correctly with extra memory. Should this be the case with the AMC100, a small, easily accessible switch is provided that will completely disable the board.

Fitting the board is a very easy task - remove the cover on the underside of the Amiga and slide the board onto the multi-pin connector. As the cover is designed to be removed, you will not be invalidating the warranty that Commodore supply with the A500.

In use, the AMC100 performed without any problems whatsoever. "Dragon's Lair" ran perfectly, as did the 1 meg version of the famous "Walker Demo" and NewTek's latest, "Demo Reel 3" (which is absolutely fantastic!). Overall, the board did everything that was expected of it. The clock seemed to maintain accurate time and the disable switch functioned correctly when tested.

If you are thinking of upgrading your A500 in the near future, the AMC100 might be just what you are looking for.

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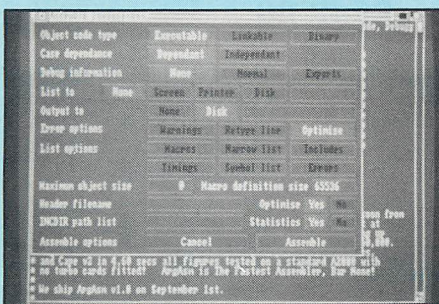
Speed Freaks

For a long time HiSoft's Devpac II has been the only choice for serious assembly language developers, Mark Smiddy compares it to Argonaut Software's, ArgAsm. Let battle commence

Mark Smiddy

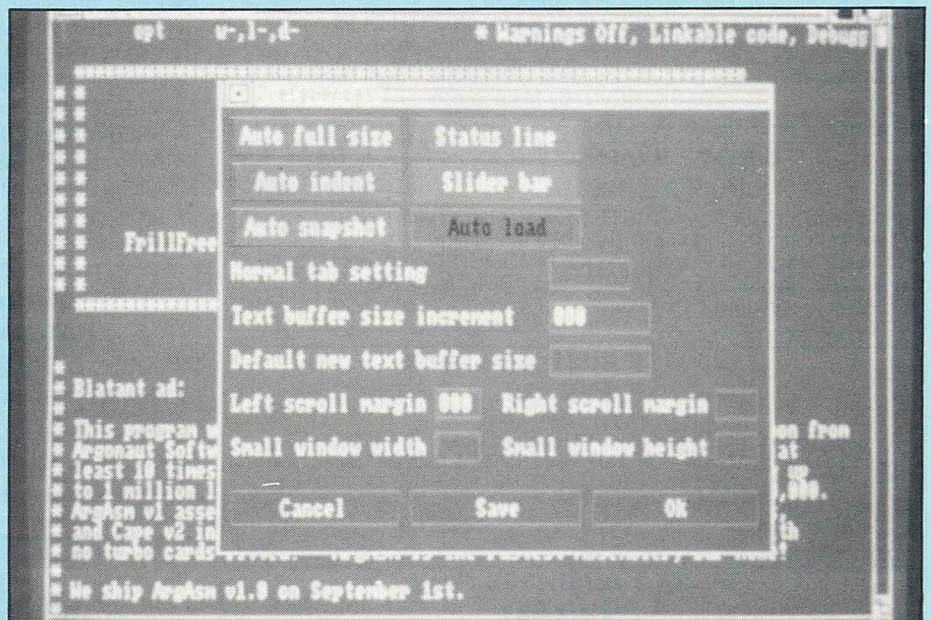
In the bad old days of the 8 bit, there were programmers who "hand coded" everything. That is: they wrote the assembly language out on paper, painstakingly worked out the hexadecimal equivalent for every instruction, then typed the lot into a hex loader. This way, relatively simple errors were easy to make and difficult to trace. Those days are far behind us now and we have to make do with some advanced programming tools: assemblers which do the job of translating the code and debuggers to help us find the mistakes afterwards.

When it comes to machine code programming on the Amiga, hand coding anything would be foolish; many programmers balk at considering anything less than a good C compiler.



Nevertheless, there are those who find pitting their wits against an assembler the ultimate challenge; and perhaps, the only way to achieve the desired result. Some people - I include myself here - find assembler easier to code and more elegant than C.

While I am not about to deny some functions are better performed by a C (or even a BASIC) compiler, there is always the option of producing a hybrid code which benefits from the best of both worlds. That is, the comparative ease of C and the raw speed of native machine code. Consider Domark's Hard Drivin' which is just such a compromise - around 20 per cent of the



source is assembly language and it still runs at breathtaking speed.

For the reasons behind these revelations, it is necessary to delve deeper into the heart of programming than would ordinarily be pertinent in a review. However for the sake of satisfying some curiosity consider this. Coded in C a portion of code may take 1mS (0.001S) to run. In assembler the same piece of code could take 0.5mS (0.0005S). If this code is only executed 5 times a second the difference of 2.5mS (0.0025S) is negligible - even though the machine code is twice as fast. Assuming the same code has be run 250 times every second the difference is 125mS! In effect the machine code loop runs 8 frames per second and the C loop runs at just 4. Since such "time-critical" portions are generally small, many programmers opt for hybrids.

One major snag with assembly language - like all non-interpreted languages - is the time taken between writing a section of code and being able to test it. In the days of interpreted BASIC you simply typed in your code and executed it directly. With an

assembler you add the extra step of having to first ASSEMBLE the code and then EXECUTE it. To complicate matters further, if you happen to be producing hybrid code, you have to add the LINK stage too.

The end result is you spend an awful lot of the development time waiting around for the assembler to finish its

"Like most of Jez San's (Argonaut's) software, ArgAsm breaks down barriers few people had considered attacking."

task - the more complex the code is, the longer assembly takes. Just to aggravate matters further, most assemblers have to make two attempts to assemble the code. This is because assembly language code often jump to a label at a later stage in the code - properly termed a forward reference. For instance:

```
start MOVEQ #50,D0
TST.B #0,22(A0,D0.W)
BEQ.S out
DBF D0,start
out
RTS
```

In this example, the assembler knows the value of the label start when it enters the section of code so the DBF instruction is valid. However, when it reaches

"To run Argasm you must have at least 1Mb RAM in your machine, more preferably, because all of that forward referencing does tend to take a lot of RAM"

the BEQ instruction, the label out has not yet been defined so it would not know where to assemble a branch to. This is, of course, normally an error, but two-pass assemblers ignore "undefined label" errors on the first pass. Once

their word? - Argasm assembles at 250,000 lines per minute or around 100 times faster than the original Commodore assembler. This compares favourably with Devpac II's 35,000 lines per minute. In addition, Argasm is supplied with ArgEd - probably the fastest editor you will ever see on a basic Amiga. True to say, there are faster ASCII file viewers but this is a multi-windowed text editor.

As assemblers go, both Argasm and Devpac are very similar on the surface. Both can produce stand-alone or linkable code and both are compatible with Invatronic's CAPE and Metacomco's Assem. ArgEd is also compatible with Devpac - but not the other way around. It contains several enhancements like

ory and check the code through the debugger. Which is the other catch with Argasm, it does not have one. Argonaut claim this is because they cannot better Monam2 (supplied with Devpac) I agree - but this gives Devpac a massive edge, even though it does suffer a lack of speed.

One simple keystroke takes you into Monam2, which has to be the best debugger around - so good it deserves a review in its own right, and is probably worth the '0 itself!

The Monam display is split into three windows - assembly, registers and memory. From here the program can be run at full speed or single-stepped and instruction at a time. It is important to note though, the current version of Monam cannot single-step ROM or the CLI commands. This is largely because some of Commodore's supplied software has access to private structures to which Monam is not privy - or put another way, some of it is badly written.

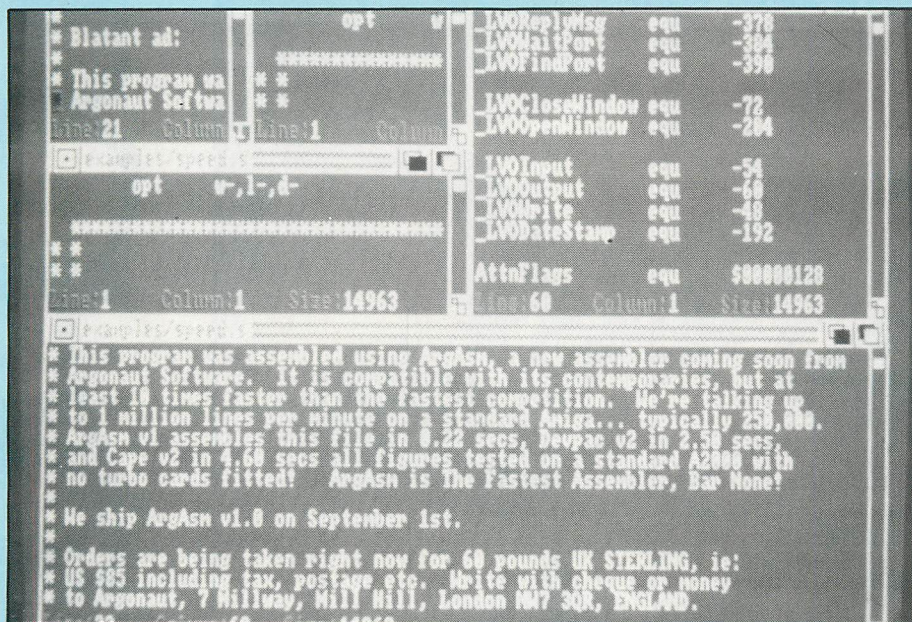
Caveats aside, Monam is very stable to use and stops programs from vanishing into the land of the Gurus' most of the time. However, it cannot trap system Gurus like "memory list scrambled" or "double call from free." It will trap the ubiquitous "Software error - Task held" requester though and help you to work out what went wrong.

At any time either of the memory or assembly windows can be split in two and locked to either a register or even indirectly to an address shown in another window. In this way you can check if your calculated addresses really end up pointing to the table you wanted and not to some odd address in low RAM. The best way to sum up Monam is to say it makes programming the Amiga in assembly language almost as easy as programming in BASIC - almost...

At the end of the day, HiSoft have to be congratulated for Devpac II. It is a superb product which beats everything to the winning post before they even leave the starting line. I have been a firm fan of Devpac since it was first released and shall continue using it until HiSoft produce something better. I am using it now to develop the software for my series on ARP and most of the top software houses would refuse to use anything else. Argonaut should learn something from the apocryphal tale of the tortoise and the hare - you do not just have to be fast to be best. **M.S.**

Product: Devpac II. Price: £59.95. Contact: HiSoft, The Old School, Greenfield, Bedford MK45 5DE. Tel: 0525 718181.

Product: Argasm. Price: £59.95. Contact: Argonaut Software, 7 Millway Hill, Mill Hill, London NW7 3QR. Tel: 01 906 3744.



the code has been scanned once completely, all the labels are defined and the actual assembly can take place on the second pass.

Although this method is inefficient, almost every assembler in existence uses it. Almost, but not Argasm. Like most of Jez San's (Argonaut's) software, Argasm breaks down barriers few people had considered attacking. Argasm approaches the previous problem in a much simpler way - it assumes all "undefined label" errors are just forward references until it reaches the end of the code.

During assembly, Argasm keeps a note of all unresolved references and, when a new label is encountered, it attempts to match it up to the list of previously undefined labels. Got that? The upshot of all this is, assembly takes place very quickly since it only requires one pass. As an aside, to make Argasm even faster, it was written in 100% assembly language - Devpac, conversely, was written in C.

This overall improvement shows in the claimed specifications. According to Argonaut - and who am I to doubt

custom instructions for handling Copper lists. Neither of them are completely compatible with the non-standard systems like Abacus' Assempro or Kuma's K-Seka. The latter being a virtual non-entity these days - it is cheap at least.

The real proof of the pudding, as the cliché goes, is in the eating and this is where the two assemblers came to blows - almost literally at one point. To run Argasm you must have at least 1Mb RAM in your machine, more preferably, because all of that forward referencing does tend to take a lot of RAM. Running the two in tandem on a even 1.5Mb Amiga gets hairy.

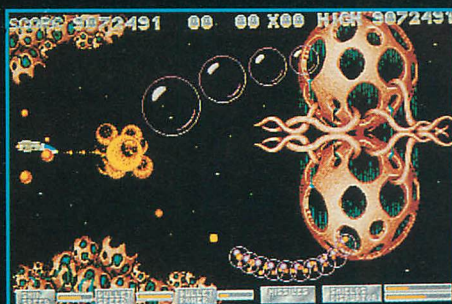
All that aside though, this was also where Argasm showed its weaknesses. At the time of writing the version of ArgEd (the editor/assembler) supplied for review refuses to generate viable run-only code. It will only generate code to disk anyway and even though it says the code will run, it will not.

Dvpac, although quite a lot slower in comparison, can generate code to either disk or memory. Either way, the code can be tested very quickly. In fact, it is more normal to assemble to mem-

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Programming Tools part 6 - When all else fails

Over the last few instalments we have looked at code generators, the Amiga's header file macros, tools like Grabbit which can ease the burden of creating graphic objects, and also some of the compiler support utilities like Lattice's CXREF. Last month we mentioned some of the other Lattice utilities and looked at the basis behind a recursive searching catalogue/file-listing program. It is actually quite good practice to write your own support utilities but most sensible people will always opt for a ready made package if they can find one that is suitable. Whilst few of us write our own disk copiers/editors, librarian or cross-reference packages there are some areas where finding suitable commercial offerings is actually quite difficult.

One obvious example of this, which is quite important to a lot of programmers, is the almost total lack of Amiga software which is able to solve program-design type logic equations. At the end of the day a lot of program design problems come down, not to code tweaking in your favourite language, but to pure and simple mathematical logic which requires the use of techniques involving Karnaugh Maps, propositional calculus (Boolean algebra), Warnier diagrams, flowcharts etc.

If, for example, you have looked in Addison Wesley's official Amiga Hardware Reference Manual you will find all sorts of details concerning blitter operations. The blitter can combine the data from three source DMA channels in up to 256 different ways and the logical operations involved often need to be dealt with as a series of logic equations. Three source bits results in eight possible bit combinations and each com-

bination can drive the target bit to either a high or low state which we can represent like this...

A	B	C	D	BLTCON0 position
0	0	0	?	0
0	0	1	?	1
0	1	0	?	2
0	1	1	?	3
1	0	0	?	4
1	0	1	?	5
1	1	0	?	6
1	1	1	?	7

This information is collected as the LF control byte in the BLTCON0 register and in effect the value in this register programs the blitter to perform one of it's 256 logical operations.

There is an approach to designing the LF control byte which involves the use of Boolean algebra and the example in the new Hardware illustrates the calculation of the function under conditions where D is one either when bit A is set and the C bit is clear, or when the B bit is set. Using Boolean algebra we can express these conditions in the following way... $D = AC' + B$

To define the LF control byte this expression needs to be converted to minterm form, that is a form where each expression involves all three source variables A,B, and C. Now this type of algebraic manipulation is easy enough to do manually when only three variables are involved but there are plenty of other occasions where a programmer might need to manipulate expressions involving a larger number of variables. As more variables are involved these type of operations become both tiresome and error prone - so it is an ideal job for a computer.

For an application like this there just does not seem to be much around in the way of Amiga utilities and I for one have yet to come across any utilities for handling minterm conversion (or the almost inverse Quin McCluskey type manipulations). I suspect that anyone who needs these type of tools ends up writing the software themselves. It is not too difficult providing you understand the underlying principles and by taking a general problem, and solving it once and for all, you can (in the long run) actually save yourself a lot of time and hard work.

Firstly however, let us see exactly what is involved with this type of minterm expansion by working through the expansion of the expression $AC' + B$, which is the example given in the Addison Wesley manual. I am using a slightly different approach to the manual but, as you will see, the results will be the same.

To get B to standard form I fill in the unknown values as ?B?. Having done that I use 1's and 0's to insert the potential candidate values. Each unknown can take either a true or a false value, so two unknown placeholders mean four possible values which mean that the four expressions become 0B0, 0B1, 1B0, and 1B1. With AC' the same sort of expansion produces $A0C' + A1C'$, so the original $AC' + B$ expression expands to six terms...

$$A0C' + A1C' + 0B0 + 0B1 + 1B0 + 1B1$$

which by replacing the corresponding 0's and 1's as primed and unprimed letters gives...

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$AB'C' + ABC' + A'BC' + A'BC + ABC' + ABC$

Eliminating duplicates in the usual fashion reduces this to

$AB'C' + ABC' + A'BC' + A'BC + ABC$

which (surprise, surprise) is the same result as that given in the Hardware manual.

These types of manipulations can also be done using Venn diagrams but the advantage of the strict Boolean algebra approach is, of course, that it can be automated. How? Well, to start with, you parse the expression from left to right inserting a marker character (I use '?') for positions which have unknown values. Each unknown is then expanded to produce the two possible states. Once a set of expressions have been produced which are free from unknowns... you just eliminate the duplicate minterms. Multiple component expressions are handled by building up the minterms for the individual component terms and then eliminating just as

you would for a single component expression.

The hardest part of the exercise is getting the minterm forms from a component Boolean expression, so it is that aspect of the problem I have concentrated on. In the program which follows the Expand() routine takes a single expression, parses it identifying unknowns and converting primed and unprimed characters into a binary form using 0's and 1's to replace the original letters. Having done that it then generates (in the array called table[]) candidate intermediate minterms by successively eliminating the unknowns. The test program basically just exercises this routine... it asks you for a list of variables, prompts you for the expression, and then prints all of the minterms that it has been able to generate. If, for example, you input a universal set of ABCDE and an expression ABDE' then the program will generate the minterm expressions ABCDE' and ABC'DE'. If you want to use the expand() routine to produce a fully fledged utility you would need to do a bit of extra work, but not

that much... a loop to allow multiple expressions to be entered, and a quick scan of the output items to remove any duplicate minterms and you will have fully automated the process in a way which will work for any number of variables.

LAST WORDS

Programmers are inherently lazy and if a ready-made tool is available they will use it rather than write their own. If on the other hand a tool is needed which isn't readily available then, in many cases, the programmer will have all the incentive they need to write one - a lot of public domain tools came into existence because someone wanted a particular utility and could not find a suitable, or a suitably cheap, commercial package. It is in areas such as this that our 'programming tools' have merged back into programming pure and simple and this is one of the reasons why, programming tools or not, most programmers usually find that there's no substitute for understanding the underlying technical ideas.

P.A.O.

```

/* -----
/* TEST PROGRAM TO CONVERT BOOLEAN EXPRESSION TO MINTERM FORM PAO 13/2/90 */

/* The expand routine scans the source term, replaces missing variables
with a ? character building a table of all possible outcomes. The
first entry in the table that does not have any ? characters will be
the start of the minterm form outputs. Note that this test program
does not remove duplicate entries.
*/

#include <stdio.h>
#include <string.h>

#define SET _1_
#define CLEAR _0_
#define UNKNOWN _\?_
#define PRIME _\__

#define MAX_VARS 7
#define MAX_TERMS 128

char var_list[MAX_VARS];
char table[MAX_TERMS][MAX_VARS];
int number_of_variables, count, base;

main()

.031

int i,j; char source_term[2*MAX_VARS],minterm[MAX_VARS];
void expand();

/* FIRST WE COLLECT THE UNIVERSAL LETTER SET AND THE EXPRESSION */
printf("variables string ? ");
scanf("%s",var_list); printf("\n");
number_of_variables=strlen(var_list);
printf("expression [use prime _ to indicate NOT.. eg A_= NOT A] ");
scanf("%s",source_term); printf("\n");

/* NOW THE TERM IS ANALYSED USING THE expand() ROUTINE */
expand(source_term,minterm);

/* AND THE RESULTS PRINTED LIKE THIS */

```

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```

printf("table follows..... \n");
for (i=base;i<base+count;i++)
{
    for (j=0;j<number_of_variables;j++)
    {
        if(table[i][j]==CLEAR)
        { printf("%c%c",var_list[j],PRIME);}
        else { printf("%c",var_list[j]);}
    }
    printf("\n");
}

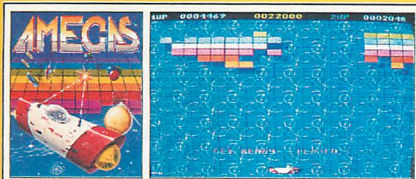
} /* LOGICAL END OF PROGRAM */

/* ----- */
/* THIS IS THE expand() ROUTINE WHICH DOES ALL OF THE HARD WORK */
void expand(char source_term[], char minterm[])
{
    int j,k,m, newcount, newbase;
    for (m=0;m<MAX_VARS;m++) 'minterm[m]=NULL;}
    j=k=m=0;
    while (k<number_of_variables)
    {
        minterm[m]=source_term[j];
        if (source_term[j]==var_list[k]) {minterm[m]=SET; j++; k++;}
        else if (source_term[j]!=PRIME) {minterm[m]=UNKNOWN; k++;}
        else {minterm[--m]=CLEAR; j++;}
        m++;
    }
    if (j<strlen(source_term)) {'minterm[--m]=CLEAR;}
    strcpy(table[0],minterm);base=0;count=1;
    for (j=0;j<number_of_variables;j++)
    { newbase=base+count; newcount=0;
    for (k=base;k<base+count;k++)
    {
        if (table[k][j]==UNKNOWN)
        {
            strcpy(table[newbase+newcount], table[k]);
            table[newbase+newcount][j]=SET; newcount++;
            strcpy(table[newbase+newcount], table[k]);
            table[newbase+newcount][j]=CLEAR; newcount++;
        }
    }
    if(newcount!=0) {base=newbase; count=newcount;}
}
}

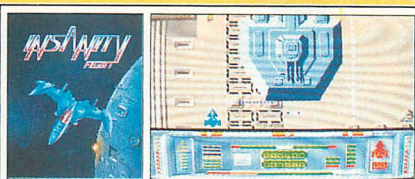
/* ----- */

```


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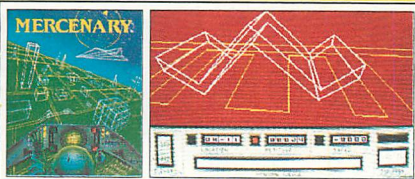
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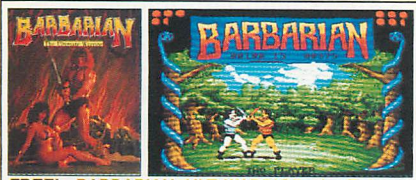
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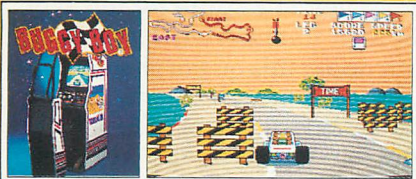
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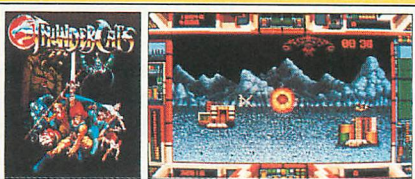
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Do you already own a computer
if so, which one do you own?

Typhoon Thompson

Domark

I know it looks a load of rubbish, but give Typhoon Thompson a chance. It comes with the programming pedigree of Broderbund, and among other recommendations, it's the most original arcade game I've played in ages.

Set in the year 2124, Typhoon Thompson is the story of a rescue attempt targeted on a lost child. Thought to be the sole survivor of an inter-galactic flight, which crash landed on the ocean planet of Aguar, it's believed that the kid has been adopted by the local sea sprites. The authorities have decided that the child must be brought back to Earth, and after three parties have failed to fish out the little one, Typhoon Thompson is put on the case.



A stern official kicks you out of the scout ship, and the game begins. Thompson (that's you) can be seen in the middle of the screen, with miles of calm sea stretching out to the horizon. A short way before the horizon are a couple of minute islands. Tilting your jet-sled forward, you prepare to meet their inhabitants, the guardians. The hooded figures give you a laser cannon and order you to retrieve a magical dagger. This dagger is held in the treasury dome of a nearby cluster of islands, which are home to a colony of sea sprites.

Getting hold of the dagger calls for more than just blasting the dome with your lasers. To persuade the treasurer to give up the artifact, you have to capture all the sprites, and hold them to ransom. Shooting or bumping into one of the tiny islands will provoke the sprite living in it to pop out and scoot about inside its "flyer". These flyers hover above the water like your sled, and come in seven varieties. The lesser flyers just push you about, or defend themselves with a

repellent force-field. Others emit suffocating bubbles, or swallow up your sled with their vacuum-funnels.

Once you've got a flyer in sight, shooting it will force the sprite to bail-out. Temporarily stunned, the sprite bobs helplessly in the water. Glide past, and Thompson automatically scoops him up and pops him in his bag. However, leave a sprite for too long, and he'll recover, before floundering back to its home island. It's worth doing this on purpose during the earlier stages, just to watch them leaping through the water like playful frogs! With all the sprites in the bag, you can knock up the treasurer. When he sees your writhing bag of sprites, he goes into a fuming rage, and hands over the dagger. Taking this back to the guardians will reward you with a new weapon and a new mission. With all four missions completed, it's off to rescue the missing child.

Broderbund have always had a soft spot for little stick men. Lode Runner, a classic platform game from their early days, featured small armies of tinies, all running, leaping and climbing about the screen. More stick men were in abundance in their similarly ancient Choplifter, which was one of the few computer games ever to have been converted to a coin-op. Yet more little people are on their way in Broderbund's forthcoming Screaming Wings, in which you're ordered to bomb hundreds of Japanese soldiers in the name of freedom. Don't they listen to Randy Newman?

The mouse control of your sled works well, allowing travel above and below the surface, with precise movements no trouble at all. It's the brilliant animation and characters that make Typhoon Thompson such a success. Although the graphics are all very small, they're very finely detailed, with loads of witty ideas, executed superbly. Unfortunately, because of their diminutive size, the graphics can be difficult to make out on a TV. A couple of extra levels would have been nice, but other than that Typhoon Thompson is brilliant. Don't miss it!

T.H.

Graphics: 81% Sound: 40% Playability: 90%
ABSOLUTE VALUE: 78% Price: £24.95

The Winning Formula Part II

Amazing Amiga Games... they all had some special formula. Tony Horgan looks back at Amiga entertainment which had that special star quality and made Amiga history

When a new computer is launched, its success or failure has a great deal to do with the software that's avail-

able for it. There's no point in buying £400's worth of custom chips if all you can play on it is chess and **Pacman**. The Amiga

can thank more than a few games for its initial and continued success, but these software masterpieces all too often fade into obscurity. Looking back at them now, it's interesting to see which have been embarrassed by the march of time, and which have managed to fight off competition from newcomers.

Defender of the Crown - it proved that there can be more to a wargame than stick men moving around a map of Legoland.



continued from page 67

In the Amiga's early years, Cinemaware's **Defender of the Crown** was by far the best demonstration of the machine's gaming possibilities. It centred around a fairly simple wargame, which was spruced up beyond recognition with screen after screen of then stunning graphics and arcade sequences. Driving the Normans out of England and Wales, you and your armies would have to raid castle treasuries, joust for respect and land at the many tournaments, gain control of Norman strongholds, and eventually be crowned King of Eng-

and eerie atmosphere.

Things began to pick up when Psygnosis put their graphical talents to use, which lead to the stunning **Arena**. In terms of gameplay there was nothing new (just bang away at the keyboard as in any other Track and Field game), but it was the graphics that amazed. **Arena's** sprites are still some of the best ever seen in any Amiga game. Unfortunately, the code that animated them was too slow to do them justice, so although they looked brilliant in still shots, the standard of animation was disappointing.

of **Barbarian**.

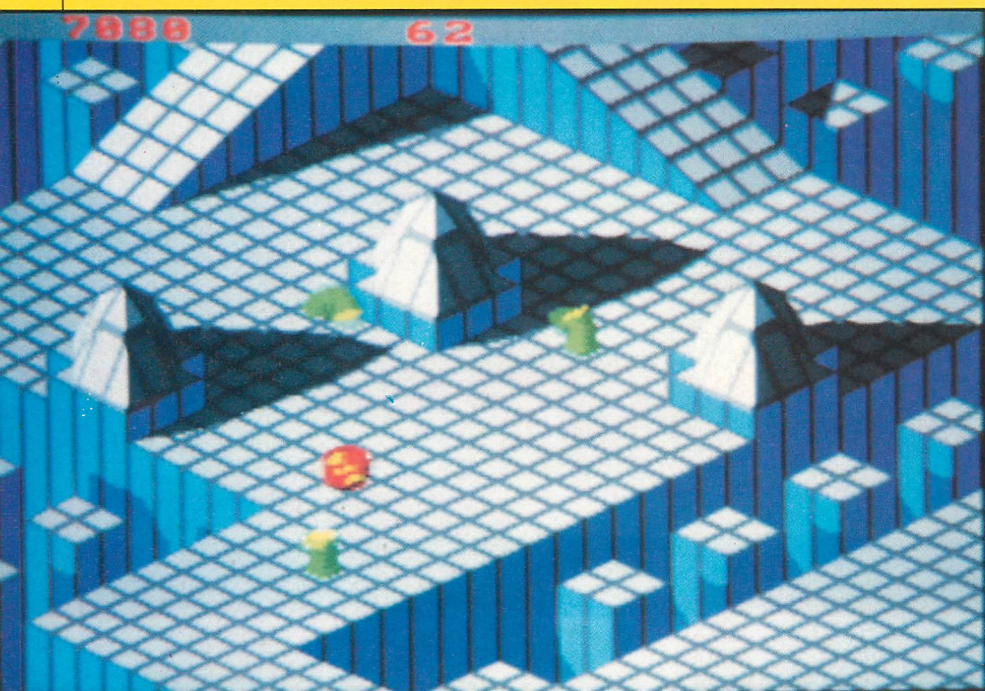
Also released during the summer of '87 was Microillusions' **Faery Tale Adventure**. It did for role-playing arcade games what **Defender of the Crown** did for wargames. Set on a massive, but surprisingly detailed island, it offered a depth approaching that of a conventional text adventure, in an arcade-style format, with a bit of role-playing thrown in for no extra charge. Just exploring the vast landscape and its many features was a hefty task, and the characters and sub-plots were deep enough to keep any adventurer going for hours at a sitting.

Although coin-op conversions are now often programmed on the 16-bit machines before the 8-bits, there was a time when the Amiga was extremely short of arcade conversions. The first of any note, if not the first ever, was Electronic Arts' **Marble Madness**. Atari's brilliantly original coin-op came across to the Amiga almost perfectly. With options to play with a trakball, mouse or joystick, even the feel of the original was captured intact.

The most hyped of the early games was **Xenon**. Superseding Rainbird's **Starglider** on the Saturday morning kids UK TV show Get Fresh, **Xenon** was billed, and accepted as the first arcade quality Amiga shoot 'em up. In fact, it was made into a coin-op which ran on Amiga hardware. **Roadwars**, **Sidewinder** and **Rockford** also followed the same route to Arcadeland, but none of them managed to cause much of a stir among the more advanced coin-ops.

A lesser-known, but far more original game from further back in the Amiga's past was **Mindwalker**. Commissioned by Commodore, it was a strange kind of arcade adventure. You controlled a character moving around a surreal, dreamy environment of platforms and what looked like half-built tower blocks. The trouble was, as far as we at AUI were concerned, that no-one knew how to play it! Because there were no instructions. In fact it was never ever sold outside the USA.

No instructions were needed for Discovery's head-turning



Marble Madness - came across to the Amiga almost perfectly.

land. Many said that the elaborate graphics hid a shallow game, not that I agree, but if nothing else, it proved that there can be more to a wargame than stick men moving around a map of Legoland.

Even earlier than that, Psygnosis, a company soon to become highly respected in the 16-bit field, finished work on what they claim was the first ever Amiga game: **Brattacus**. Even Psygnosis would admit that today the game looks pretty dated, to say the least. At the time it was a brave move, when everyone was waiting to see what everyone else was going to do on the 16-bit front. The flip-screen platform arcade adventure was never mindblowing, but nevertheless had a unique style, possibly from its tall sprites

Applying this artistic bent to a completely different game, they amazed Amiga users once again, this time with **Barbarian**. There was the added bonus of the now standard sampled sound effects, which together with the wide range of cavemen, pigmy rhinos, zombies and the like made it a favourite for months in the AUI office. The somewhat comical hero had a string of available actions, which probably would have been too numerous to fit into a joystick control. Instead, a row of mouse-activated icons was used, which in some ways helped cover up the slow response carried over from **Arena**. As with **Arena**, you would be very hard-pushed to find any more imaginative, detailed and well drawn sprites than those



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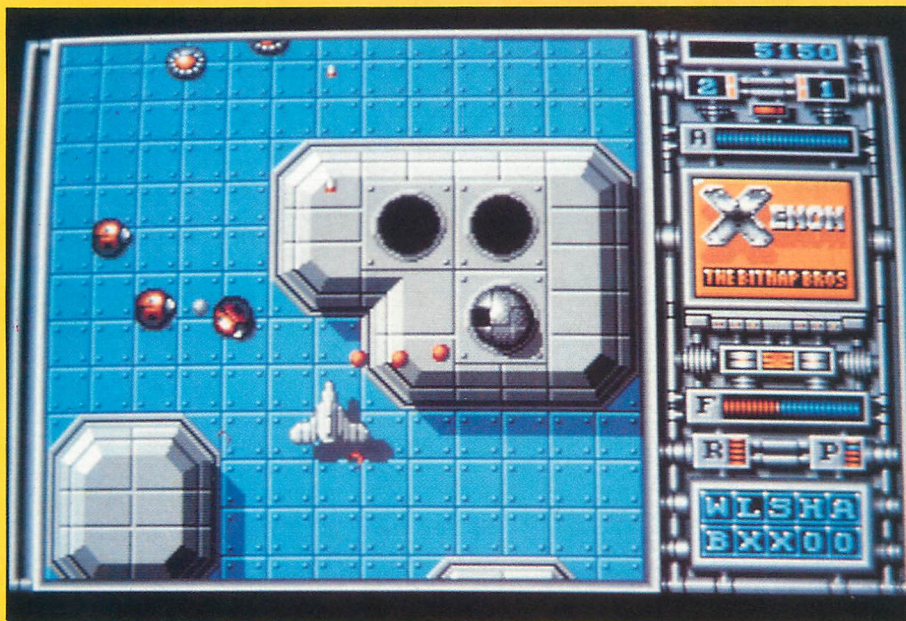
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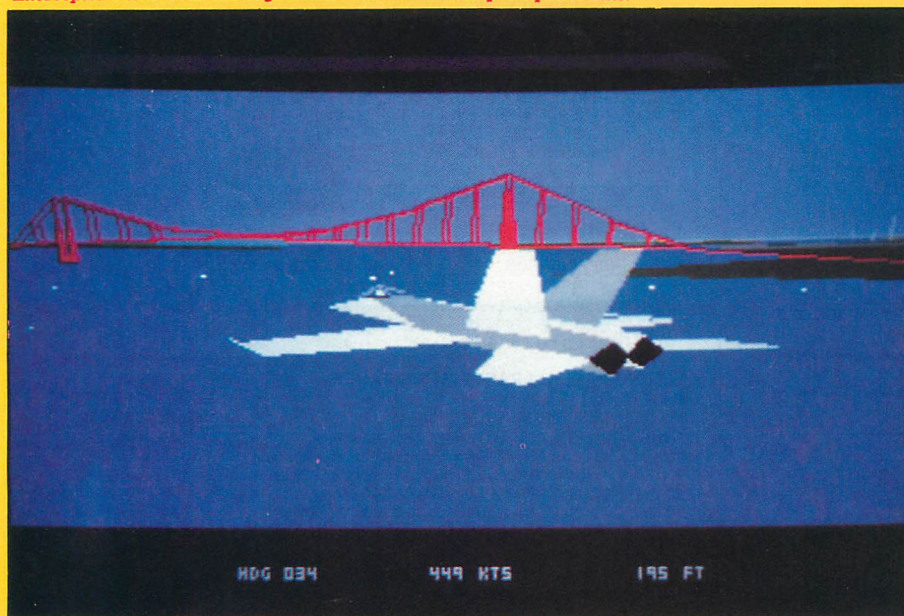


Xenon - the first arcade quality Amiga shoot 'em up.

Sword of Sodan. Its enormous sprites far out-did anything that had gone before, and anything that has appeared since. It provided yet more proof, if any was needed, that the Amiga really could do some amazing things, with a decent bunch of programmers at the controls. Around a very basic game structure of walk-stab-walk-duck action, Discovery built a game full of atmosphere and surprises. One of the all time greats without a doubt.

Also breaking new ground in the Amiga's adolescent days was Electronic Arts' **Interceptor**. Solid 3D was still the exception rather than the rule, and its exterior views, simple controls and pacey gameplay marked the start

Interceptor - won over the flight buffs and casual computer pilots alike.



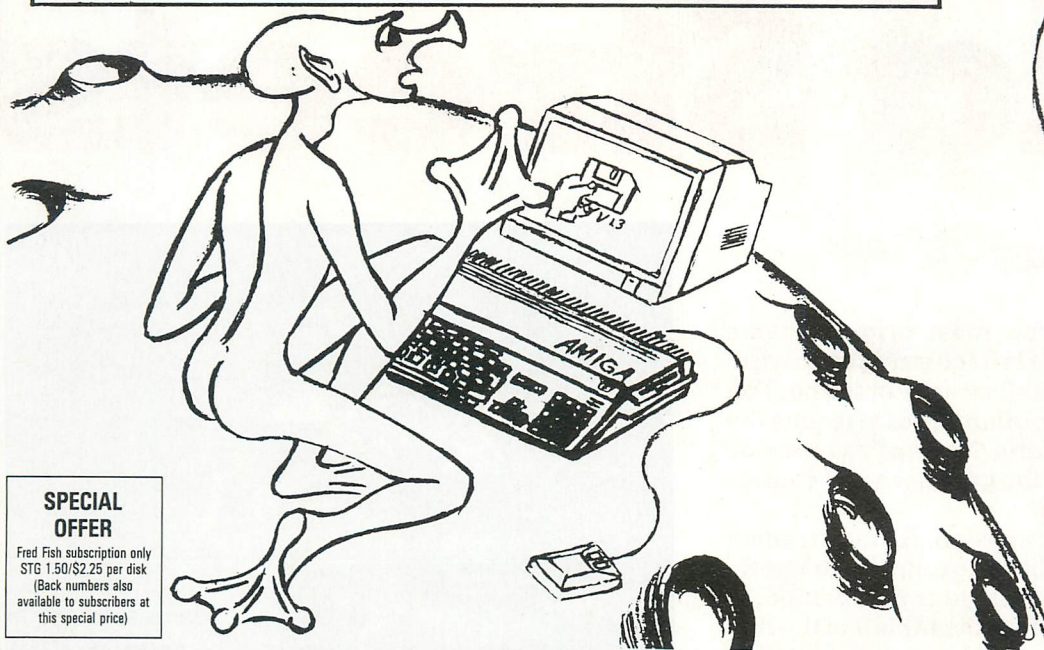
Sword of Sodan - one of the all time greats.

they possessed and so many other games didn't? They were all different but shoot 'em ups or adventures puzzles or flight sims. They had two things in common - creativity and originality. They did things on the monitor screen that no-one had done on the Amiga before, in fact in most cases not any personal computer before. That's what made them great - what gave them that explosive 'wow' factor? That was the winning formula - their creativity and their originality.

With a sharp eye, you could still catch a few of those old but golden classics gathering dust in bargain buckets and compilations. Happy hunting! They're worth it.

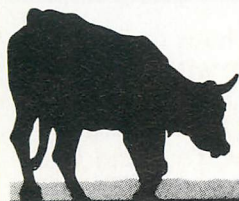
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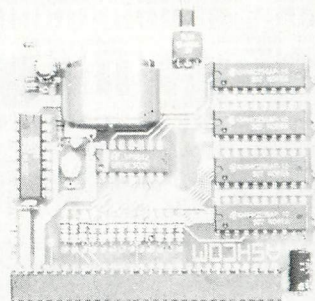
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Wild Streets

Titus

Wild Streets isn't the most original game around, but neither is it the straight forward Vigilante clone it at first appears to be. You do in fact play the part of a vigilante, out to rescue the chief of the CIA from the Mafia. News of your rescue attempt has been leaked to the gangs who, of course, are out in force to stop you.

You're not alone in your mission. A black trained panther (the animal not political group), who knows a baddie when he sees one, is your companion. A helicopter drops you both off at the far left of the five levels. While you go about your business of beating up the thugs, the panther calmly stalks around, selecting a victim, one of your attackers, to maul. Every now and then, he'll pounce and bring down his prey, with a disappointing lack of gore. Both you and the panther have energy levels, which decrease as you get beaten up. The panther is very slow in leaving each screen, so if you hang around for him, you're likely to get a pasting by the endless stream of thugs. Because of this, usually you'll only have his limited backup on the first couple of screens in each level.

High kicks, punches and all the other standard moves are available, but most of the time the flying kick is the most effective. You also have a pistol with limited ammunition, which is best saved for the gang bosses at the end of each level. The levels' scenery varies, but the opponents are more or less the same throughout the game.



Most games finish once you've reached the hostage, but in Wild Streets, you have to escort the CIA chief back through the thug-ridden levels to the start. Like your panther, he's slow and gets into trouble, but this time you can't go off alone. Once you've got him back, there's a congratulatory screen and it's game over.

The main problem with Wild Streets is that it's far



too easy. It took me about half an hour to finish the game, without any cheats, and even without reading the instructions (Of course! Ed). Setting a game's difficulty level is not an easy task, but I would have thought that anyone can see that it's going to be completed by most people in the first day. The only difficult feature is the extremely irritating slow response to the joystick. When you do get killed, it's almost always because the program hasn't acknowledged your joystick movements by the time the enemy knocks you down again.

Animation of the central character is smooth, but robotic. Your feline friend is very well created and has lifelike movements, but it still looks rather like a stuffed moggy when he pounces. The rest of the characters move unrealistically, but with fewer frames of animation. While the music is extremely repetitive, the sound effects aren't bad. Wild Streets could have made a very entertaining beat 'em up, but its rough edges and severe shortage of difficulty bring it right down, and charging £25 for what is a budget quality release shows a lack of respect for the buying public.

T.H.

Charles Bronson, fed up of being typecast as a nice young gentleman, actually had plastic surgery to make himself ugly, and has never looked back since. The 'Death Wish' films made him, playing the Vigilante cleaning up the streets of the USA one of the most highly paid screen actors. They have also made Michael Winner, the films' director and producer, a multimillionaire. For some people, crime pays.

Graphics: 51% Text: 47% Playability: 44%
ABSOLUTE VALUE: 35% Price: £24.99

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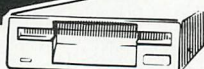
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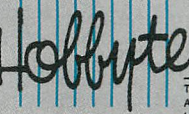


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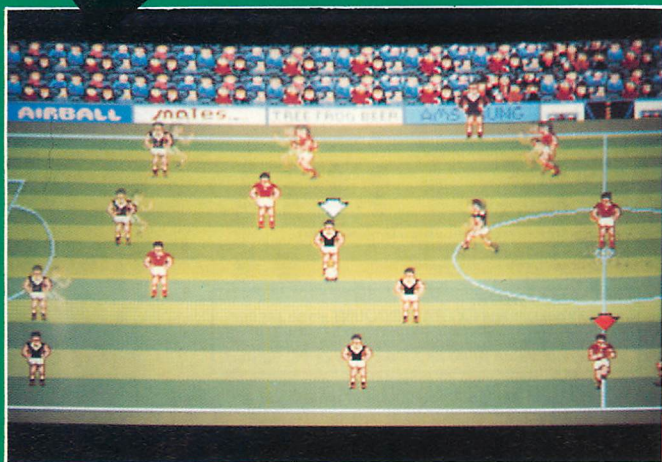
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For a soccer simulation that has been around for over 18 months, a long time in computer terms, International Soccer has had to put up with some really stiff opposition. Throughout this time there have been many games that are said to have much better attributes, although in my mind, none of them can match up to the likeable gameplay and graphics this game has to offer.

Microdeal are better known for their more serious software applications such as "Master Sound" and "Talespin" rather than for their games. They are, in fact, putting their arcade style games away for a while to concentrate on the serious stuff. To get rid of their games they have put a special offer on a few of these asking a mere £4.00, pretty good value and some great bargains to be had.

Microdeal

"The matches have full eleven-a-side teams, you control one player at a time indicated by a coloured arrow over the players head"



This little number has stood the test of time well. When it was released it wasn't given a great deal of media coverage, and I suppose this may be responsible for its rather quiet existence. I personally can't understand why it didn't find rave reviews at the time.

The game offers good graphics and sound. There are choices of pitch conditions, weather, team formation, match length, flood-light evening matches and team colours. The matches have full eleven-a-side teams, you control one player at a time indicated by a coloured arrow over the players head.

Movement of the players is by the joystick. You may play by yourself against the computer or play against a live opponent. Both players may even team up against the computer or, with a special adapter, four players may play two against two. Each option against the computer has skill level settings from 1 - 9.

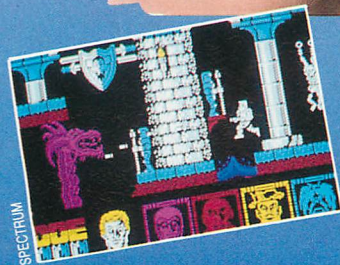
You can kick into touch all your other footy sims as far as I'm concerned. The view of the pitch is the more conventional side view rather than the peculiar overhead view offered by some others. Animated crowds jump up and down with excitement as the match progresses. A huge electronic scoreboard keeps you informed of the goings on.

Although International Soccer cannot offer managerial decisions, league tables or cup matches it does offer more than enough to have my vote for the best soccer sim around. The music, although not important, is not only great but there are three tunes to help keep your feet tapping, your mouth rapping and your joystick zapping! So here we go...etc...etc. For four pounds you can't get a better deal.

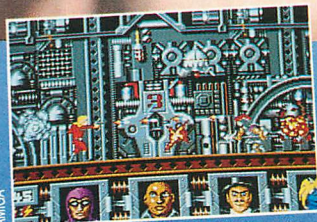
B.C.

Graphics: 70% Sound: 70% Playability: 65%
ABSOLUTE VALUE: 88% Price: £4.00

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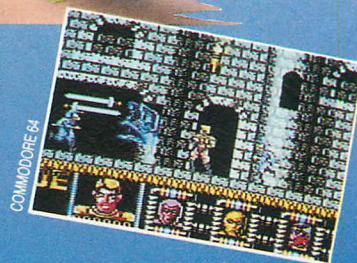
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ENIGMA VARIATIONS



Aquanaut

Addictive Games

Remember Fission Chip, the programmers of The Kristal? They're back on the scene with Aquanaut, a three part arcade adventure, which may not have the stunning graphics of The Kristal, but has a few tricks of its own up its sleeve

The leader of an aggressive alien race has managed to penetrate the protective barrier put up around the Earth's atmosphere in the early 21st century. So far he has eluded all attempts to find him, but he has been tracked to a sub-aqua location somewhere around the Carribean. A top commando, skilled in combat and scuba diving, has been sent in to fish out the intruder. You, as the diver, are dropped off in the approximate area of the alien leader. So starts the first of the game's three sections.

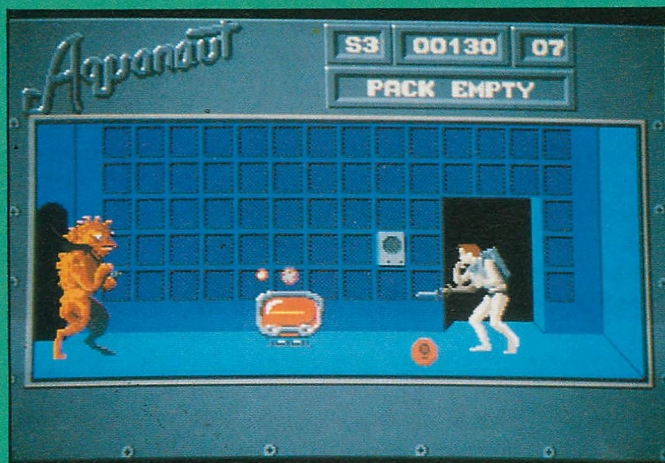
After the short intro sequence, things get off on a good foot, with some excellent animation of your character breaking the surface of the water and getting his bearings. From here on it takes the form of a right to left scrolling shoot 'em up, drawn away from the usual R-Type clones by its seafaring theme. You're armed with exploding harpoons, essential for fighting off the sharks, swordfish and jellyfish. Even during the odd moment when there's no immediate danger, the screen is kept busy by the abundance of

small tropical fish. There are a few friends to be found, like the dolphins and extra life-giving mermaids. Half way through you'll have to pick up equipment dropped off by your companions, and you'll also get a chance to refill your air tanks.

Once into the second stage, the pace becomes a little more relaxed. In this, the least entertaining of the three levels, you have to find your way around a rocky labyrinth, puzzling your way past some savage sea monsters. A bit of eerie music would have helped increase the interest level.

"Even during the odd moment when there's no immediate danger, the screen is kept busy by the abundance of small tropical fish."

Stage three sees you discarding your rather short fins as you explore the lost city of Atlantis. Presented as a traditional flip-screen arcade adventure, it develops the object manipulation side of the game. In between sticking knives into seven foot tall orange aliens, you'll have to find your way around the maze of corridors and chambers, figuring out what all the strange objects do. Although the interior decor of Atlantis looks as if it was designed on a Spectrum, this is the most involving of the three levels.

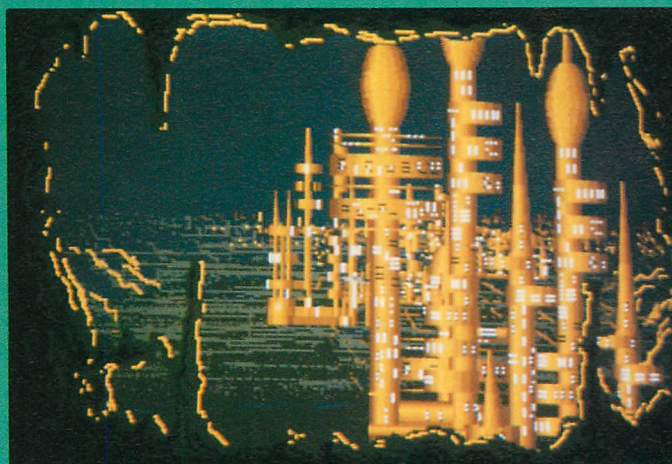


As with The Kristal, Fission Chip's sense of humour is very much in evidence in Aquanaut. After each death, you're given a brief description of how you met your match, with one of a few cartoon graphic depictions of your stung, skewered or zapped body. One of the nicest pieces of animation can be seen during the final stage when rolling to avoid shots from the aliens. However, spend too long rolling around on the floor and you'll end up with a broken neck! Most of the other graphics are unremarkable, but it's these little details that brighten up what could otherwise have been a rather ordinary game.

While there's not much in the way of music, the sampled sound effects are pretty good. Touch the mermaid for example, and you'll get a squeaky kiss



"In between sticking knives into seven foot tall orange aliens, you'll have to find your way around the maze of corridors and chambers, figuring out what all the strange objects do."



with that extra life. Project leader Mike Sutin tells us they had a lot of fun in the bathroom, sampling the various squelches and gurgles! Make of that what you will!

Aquanaut isn't sensational and doesn't have much new in the way of gameplay, but it's a fun game all the same. The facility to skip to the later levels once you've completed the earlier ones works well, getting round the problem of playing through the first level time after time. Its ST origins are less apparent than you would expect, and the whole thing hangs together well. A very pleasant game all round really.

T.H.

Graphics: 67% Sound: 76% Playability: 75%
ABSOLUTE VALUE: 74% Price: £24.95

Sideshow

Actionware

If Operation Thunderbolt was a bit too gory for your liking, how about a spot of more innocent target practice? Actionware's latest offers you a crack at eight circus sideshows, all with a common rifle range theme. If your budget allows, for added realism, you can play the game with Actionware's light gun. The less thrifty among us have to make do with a mouse-controlled crosshair.

Before you play any of the booths, you have to buy either a child or an adult ticket. Each game costs a certain amount of tokens. Opting for a child ticket will give you more tokens, but only five of the games will be open to you. You also have to take into account the differing hunger rating of the two tickets. Buy an adult ticket, and you'll have to pay more frequent visits to the hot dog stand. Let your appetite grow larger than your finances, and you'll have to go home and raid the fridge: game over.

The first of the sideshows is the balloon booth. Rows of balloons have been fixed to the back wall of the booth. Under each balloon is a tile with either a positive or a negative number on it. The object is to find all the positive tiles, whilst hitting as few negative tiles as possible. It's not completely down to luck, as the positive tiles are arranged in one of a few set patterns. As with the rest of the sideshows, if you win back more tokens than it costs to play, you've won that game. The aim of the whole game is

"Buy an adult ticket, and you'll have to pay more frequent visits to the hot dog stand"



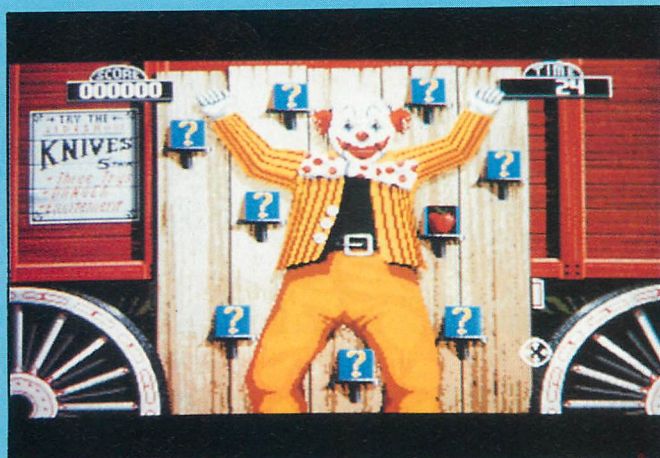
"Although the game comes on three disks, the gameplay follows a simple pattern of point and click, or aim and fire in the case of the light gun"

to win each booth three times.

A more familiar booth is the duck-shoot. All kinds of objects cross the screen, including planes, cars, submarines, and of course, ducks. Most can be shot at any time for points. A few can only be shot when they flash, otherwise they'll reduce your score. All the other games call for similar sharp shooting, each with its own theme.

There's a lot more variety in the subjects of the various booths than you'd expect. Unfortunately, they all demand exactly the same skills. Although the game comes on three disks, the gameplay follows a simple pattern of point and click, or aim and fire in the case of the light gun. The same can be said of Operation Thunderbolt, but that was compensated for by the frantic action and dynamic graphics. Sideshow on the other hand, is lacking in excitement, and so tends to get boring before long. Shooting balloons and wooden ducks fails to create the gripping atmosphere of a raging battle against heavily armed terrorists. Anyone not sharing my thirst for blood may well get a lot more out of Sideshow. One for the kiddies and faint hearted.

T.H.



Graphics: 65% Sound: 60% Playability: 57%
ABSOLUTE VALUE: 59% Price: £24.99



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P-47

Firebird

Not a government form, but a World War II fighter plane, the P-47 fills the central role of Firebird's latest. Converted from the yawn some Jaleco arcade machine, P-47 promises eight frenzied levels of enemy activity. What you get is something rather different.

There's no attempt made to back up your mission of death with any storyline, which chalks up an early point in its favour. That point is immediately cancelled out as the options screen loads in the default settings of keyboard control for both players. What is the reasoning behind that? How many Amiga-owning shoot 'em up fans do you know who don't have a joystick? Unnecessary hassles have no place in a shoot 'em up.

Once into the game, events take a familiar route. The screen scrolls at a constant pace, while you fight off an assault from air and ground-based enemies. The fleets of hostile fighters pootle around in loose formation, occasionally releasing slow moving missiles. Down on the ground, tanks and SAM launchers let rip with less easily dodged shells. The end of each level brings on a big tank, plane or battleship. The themes of most levels are the usual mountainous

country and seascapes, but the second level's sunset is a nice idea.

The Republic P-47 Thunderbolt was one of the top American fighter planes in World War II. In 1943 P47s were under the control of the British RAF Fighter Command, and operating from bases in England. Their principal tasks were relatively short-range sorties over Northern France. The following year they were equipped with "drop-tanks" mounted under them, giving the extra fuel needed to compliment their immense fire-power, and enabled deep daylight raids further behind enemy lines.

P-47 is unspectacular to look at, with its small sprites and unadventurous backgrounds. Extravagant explosions and inventive weapons are nowhere to be found. Worse still, all these graphics jerk around the screen, which often only leaves a vague illusion of animation with the faster objects such as bullets and bombs. Smooth scrolling is an essential requirement for a decent zapper, and the lack of it lowers the tone of P-47 considerably.

Weak graphics, unoriginal design, lazy sound and drab gameplay don't amount to the most inviting shoot 'em up. If you like the sound of the scenario, you'd be far better off getting hold of Virgin's Silk-worm, which is just as unoriginal, but outclasses it in every other aspect.

T.H.

Graphics: 54% Sound: 35% Playability: 52%
ABSOLUTE VALUE: 36% Price: £24.99



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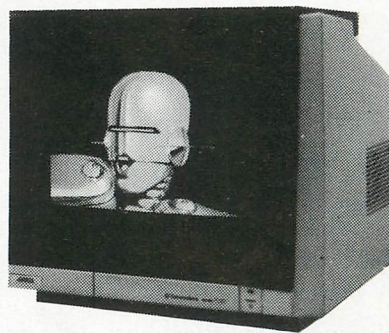


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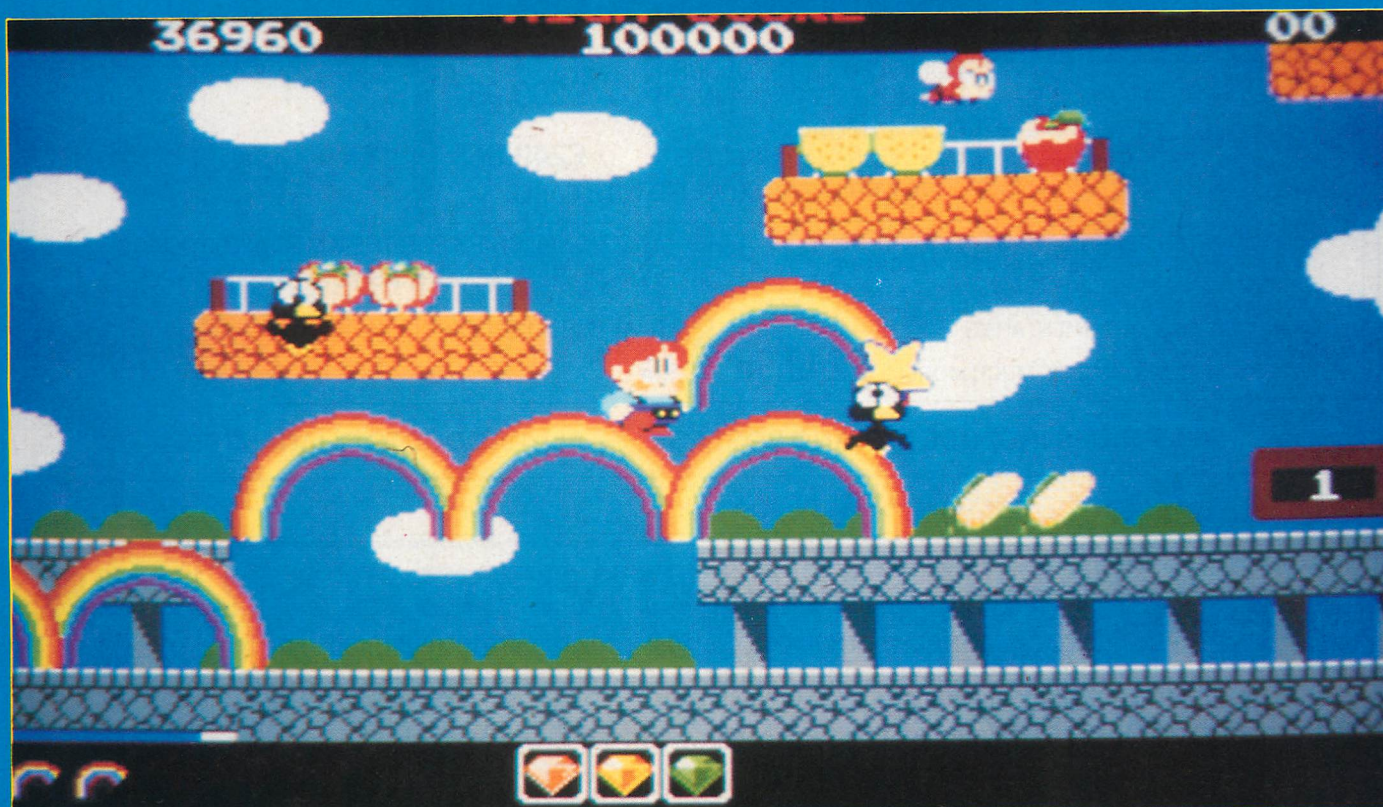
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Rainbow Islands

Ocean



Now here's a game Mary Whitehouse would love, and so will just about everyone else! No vicious decapitation, no guns, no gore, or in fact anything else in the least bit offensive can be found in the sequel to Taito's Bubble Bobble. Not great recommendations for an arcade game you

may think, but Rainbow Islands goes to show that you can have fun without driving a Ferrari and machine-gunning criminals.

Bub and Bob, the heroes from Bubble Bobble, play the central roles in the follow-up. Since the first game, they've changed from cuddly dinosaurs into cuddly kids, but this time there's no option for both to play at once. There's no real plot, but somehow the

"Where platforms are in short supply, a rainbow can be used instead"

two have found themselves in a magical land made up of seven islands. The inhabitants are far from hospitable, so the best idea seems to be to get to the top of each level, escaping through the remaining six islands.

Your ability to destroy your enemies with bubbles has been replaced by a more colourful talent. Pressing fire releases a shooting star, which leaves





behind it a rainbow. These rainbows are extremely handy, not to mention versatile. Where platforms are in short supply, a rainbow can be used instead. You can also use them to stun the baddies and turn them into fruit or sweets, which again can be collected with another rainbow. If you manage to trap a baddie underneath a rainbow, you can climb the slippery arc, stomp on it and rid yourself of another enemy with the shattered fragments.

"The top of the final level in each island houses the boss, who as always takes a good deal of magical zapping before revealing a chest of mega-goodies"

Each island is split into a number of levels. The first of the islands is home to some of the cutest insects you've ever seen. Fat caterpillars and spooky spiders are your main concern, but liberal use of your rainbows keeps them at bay. You'll find that as well as all the zapped baddies turning to goodies, slices of cake, flowers and ice creams keep popping up all over the place, all to be collected for extra points. There are also a few special items to be collected. Magic shoes speed you up, red potions give you double or even triple rainbows, and yellow potions turbo-charge your rainbow casting. The top of the final level in each island houses the boss, who



as always takes a good deal of magical zapping before revealing a chest of mega-goodies.

Believe it or not, Rainbow Islands is even cuter, cuddlier and squidgier than Bubble Bobble. Programmers Graftgold have done a brilliant job of converting the coin-op's graphics. As you'd expect, there's plenty of colour, but it's always tastefully done. The sprites are superb, your character especially. The abundant goodies are so appetising, that scooping up the contents of the end-of-level chests is extremely satisfying.

Although it has only just been released, Graftgold finished programming Rainbow Islands last year. The game was originally planned for release through Telecomsoft's Firebird label. However, since the purchase of Telecomsoft by Microprose, Ocean got their hands on the copyright, and look set to make a tasty packet out of the deal. Not a bad move really.



Satisfaction is the game's biggest attraction. There's no limit on the amount of rainbows you can cast, which makes a nice change from being restricted to firing single shots from a pea-shooter. Another nice feature is its initially low difficulty level, so you can get into the swing of things without too much trouble. Andrew Braybrook has fulfilled his part of the bargain, programming a smooth moving and pacey game. As is usual for these cutey games, the sound is quite tinny, but jolly all the same. A remix of Somewhere Over the Rainbow plays in the background, along with appropriate sound effects.

A mention must go to Bob Wakelin's brilliant cover artwork, which emphasises his status as the best in the business by a long shot. It's great to see that the game lives up to the promise of the packaging. While Rainbow Islands is an obvious choice for the younger player, you don't have to be a kid to get a lot out of it. A superb conversion of a great coin-op, which shouldn't be missed by anyone.

T.H.

Graphics: 69% Sound: 61% Playability: 72%
ABSOLUTE VALUE: 70% Price: \$24.95

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WET! WET! WET!

Electronic Zoo, the company that brought us the hit shoot 'em up Battle Squadron, are about to release their next game for the Amiga.

"Treasure Trap" takes you on an underwater adventure as you search for treasure on the sunken wreck of the good ship Esmeralda.

To the launch of Treasure Trap, AMIGA USER INTERNATIONAL has got together with ELECTRONIC ZOO to bring you a really wet competition!!

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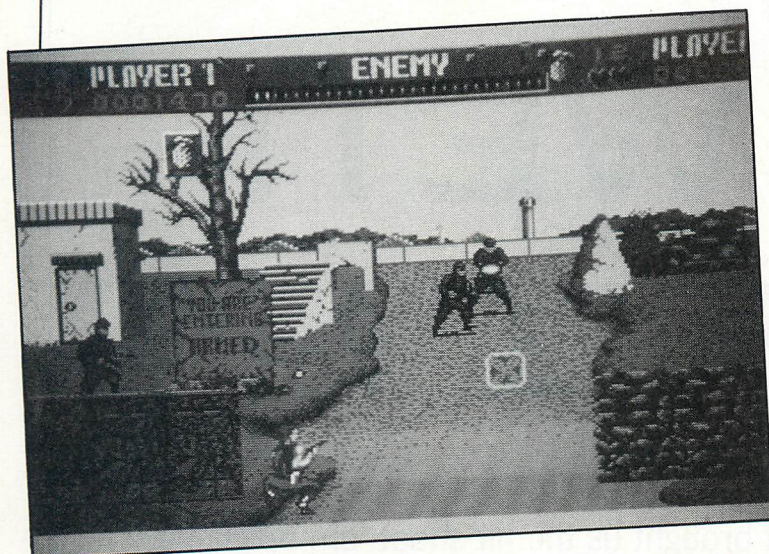
Plus, twenty five runners up will receive copies of Battle Squadron.

To be in with a chance of winning, simply answer the following questions (on a postcard please) and send them in before 15th. July 1990. Don't forget to include your name, address and telephone number.

1. For what is Jaques Cousteau famous?
2. What do the initials S.C.U.B.A. stand for?
3. What are "the bends"?
4. Which famous soap star played "The Man from Atlantis"?
5. Name the famous wreck lifted from the Solent.

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"A recent trend in shoot 'em ups seems to be to bump up the difficulty level to near-unplayable heights, but completing Cabal is more of a realistic prospect"

moving bullets and lobbing grenades. You can only dodge the attacks by rolling or running to either side; retreating is against your principles. You have a few sandbags to hide behind, but these usually don't last long in the crossfire. Unlike most games, you can blow up just about everything on

Cabal

Ocean

Pronounced ca-bal rather than cable, Ocean's latest portion of death and bullets is a conversion of the Operation Wolf-inspired coinop. It was never a smash in the arcades, but all the same, the Mancunian mob have made the most their licence.

"By the end of a level, there's often nothing left but a lone, leafless tree standing in the middle of a wasteland"

It's all about the exploits of a couple of soldiers, doing what they do best: killing people and blowing up buildings. The duo have orders to fight their way through countless areas of enemy activity. It's up to you and an optional friend to guide them through to the end, preferably with all limbs and vital organs intact.

Unlike Op Wolf, you see both of the player sprites at the bottom of the screen. Both are armed with a machine gun and a handful of grenades. The enemy stream in from both sides, firing slow-

screen. All the huts and houses can be demolished with concentrated machine-gun fire or grenades. By the end of a level, there's often nothing left but a lone, leafless tree standing in the middle of a wasteland. Victory is met with the players running ecstatically over the horizon, to the sound of a strangely jolly jingle.

Cabal: Secret intrigue; political clique, faction; committee of five ministers under Charles II, whose surnames happened to begin with C, A, B, A and L.

Most of the sprites are fairly small, but have some excellent animation (watch the grenade lobbers lean back, wind up and let rip). Although the gameplay stays pretty much as is started, there's a good variety in the backdrops, and even the novice should get to see a fair few different levels. A recent trend in shoot 'em ups seems to be to bump up the difficulty level to near-unplayable heights, but completing Cabal is more of a realistic prospect. While it's not too easy, it is nice to play a game that gives you a fair chance.

The sound tends to merge into one chorus of explosions and gunfire. However, the game plays well, and couldn't be easier to pick up. It's a bit lacking in thrill power, and I wouldn't think it has too much long-term appeal, but Cabal will go down well with fans of the coin-op and a good few others besides.

T.H.

Graphics: 69% Sound: 61% Playability: 72%
ABSOLUTE VALUE: 70% Price: £24.95

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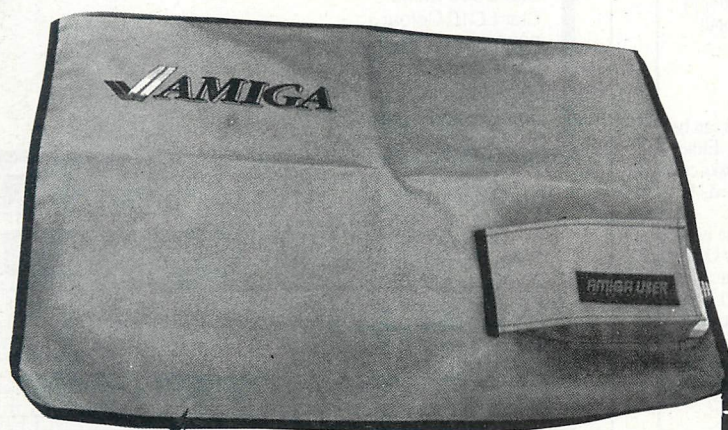
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continued on page 92

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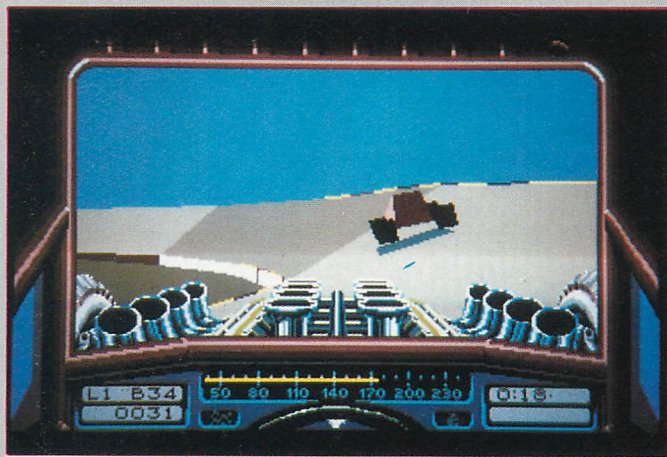
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Ever since Outrun revived the 3D racing game, there's been a steady flow of progressions on the theme, both in the arcades and the home computer market. That flow peaked just before Christmas '89, with just about all the major software houses putting their money on conversions of well-known racey coin-ops. Although the programmers of the coin-ops and the home computer conversions set out with the same goals, the ways in which the two go about their work is often surprisingly different.

If you want a computer to do some-

"With all the graphics drawn at every possible size, they eat away a lot more memory than one source sprite would do"

thing as quickly as possible, and the facility is there, it's essential to get the hardware to do the work. The speed at which a specialised piece of hardware

can perform a function, will almost always exceed that of software on the same machine. Because of this, coin-ops such as Sega's Outrun, Thunderblade and Power Drift, use custom chips for all their graphics manipulation. Take Outrun for an example. All of the graphics can be split in three main categories: 3D sprites, colour bars and curves, and fixed-size sprites. The 3D sprites include all the objects on and beside the road. The colour bars and curves make up the road itself, and the fixed-size sprites take care of the scroll-

continued on page 94



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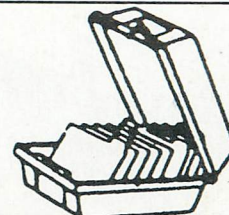


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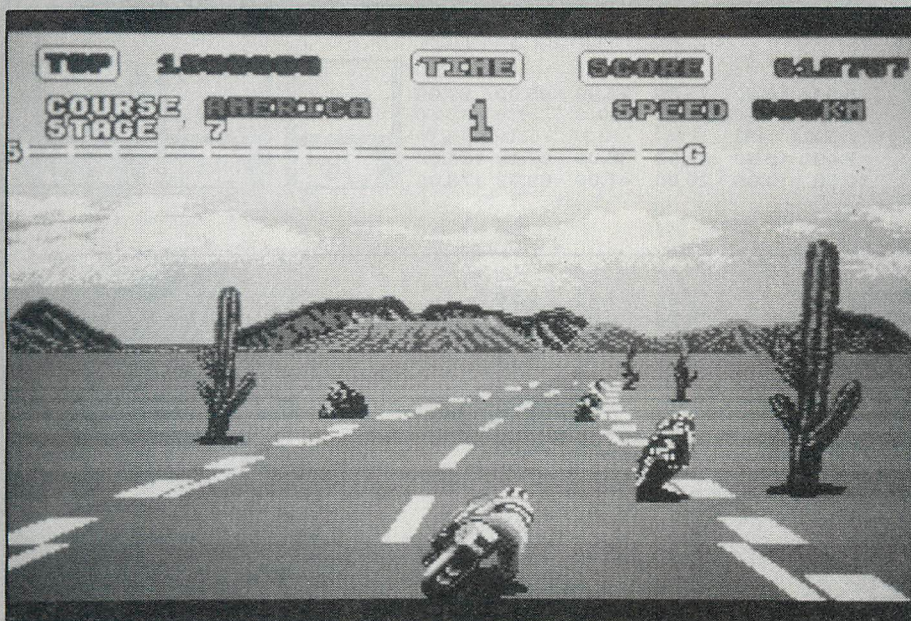
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Super Hang-On

ing horizon, status panel and any other 2D graphics.

Drawing a moving road, and sliding a few sprites around the screen is all in a day's work for even the simplest coin-op. Troubles arise when you try expanding or shrinking big sprites, and plotting them on screen fast enough to keep up the illusion of movement. Outrun and all of its rivals get around this with their own sprite scaling hardware. From an original sprite, usually a little smaller than the largest possible frame, the appropriate sized frames are calculated and plotted into position when they are needed. This can have the side effect of producing slightly scruffy sprites. By scanning through the pixels of the source sprite, and taking for example every third pixel, you'll get a sprite a third of the size, but what's mathematically correct isn't always what gives the best appearance. Fortunately, the speed usually glosses over any of these imperfections.

Life for the programmer of a coin-op to Amiga conversion is not so comfortable. Although there's help from the blitter, which can ease the burden of complex maths, emulating the far superior custom chips of coin-ops is no simple task. Rather than attempt to copy the coin-ops' technique of real-time sprite scaling, most programmers scale their sprites beforehand. Anything from about eight frames upwards is predefined and stored in memory. That way, rather than facing a lorryload of calculations every split second, the program just looks for the ready-drawn frame, and puts it up on screen. Although the coin-ops' mathematical scaling method isn't used during the game, similar techniques are often employed to create the different sized sprite frames. Of course this saves time for the artist, but without retouching, the

sprites can look untidy in the same way as those of the coin-ops. Better results are often achieved by hand drawing each frame, which helps retain any relevant details which may have otherwise been lost. With all the graphics drawn at every possible size, they eat away a lot more memory than one source sprite would do. If you want the speed with bitmapped sprites, and don't have hardware support, that's the way it has to be.

Sprites are fine if you only ever approach each object from the same direction, but for a more convincing "real world" environment, you're better off using vector graphics. In a vectored game, every object is defined by a set of co-ordinates, or nodes, and dimensions, in all three X,Y and Z axes. That way, any feature of the game's landscape, world or universe can be viewed from any angle, at any scale. In a conventional bitmapped game, a sprite the size of the screen would take up an enormous amount of memory. Each pixel, depending on the number of colours in the sprite, could consume anything from a bit up to a full byte, or possibly even more. A monochrome sprite covering the Amiga's lo-res screen would engulf over 8K. A similar sprite made up of a possible 256 colours (not an unrealistic prospect for a coin-op) would boost that to over 65K! A combination of polygons, such as the barn in *Hard Drivin'* for example, could be blown up to the same size, without any loss of resolution, and the only data need to define it would be a handful of dimensions and a few bytes to decide its colours.

Unfortunately for the programmer, although this is a great memory conservation technique, finding a way to display these vectors on screen quickly

enough is not easy. By simplifying the routines that plot the objects, and applying an extensive knowledge of complex maths, the brighter programmer can ease the burden of the computer. Transparent vectors used to be all you could expect to find on a home computer or coin-op. Now solids have become the norm, allowing far more realistic games than before. Although Atari's *Hard Drivin'* is widely regarded as the best vectored coin-op, Namco's *Winning Run* must be the fastest and most realistic.

Most would agree that the best use of vectors in an Amiga racing game can be found in Geoff Crammond's *Stunt Car Racer*. It borrows ideas from a few existing coin-ops, but the result is still surprisingly original. Instead of racing around the usual grand prix circuits or city streets, your driving skills are put to the test over eight vicious tracks of banked corners, humps, jumps and sheer drops. With a more substantial long term challenge, it beats the coin-ops on staying power, and months after its release, *Stunt Car Racer* is still my current favourite.

As for the future, there are a few things I would like to see happen. First, an Amiga version of Electronic Arts' *Indy 500* would be nice, as it's only available for PC owners at the moment. More two-player head to head games would also go down well. *Pitstop II* and *Final Lap* rank highly in my all time chart, just for the tension they create in a two-player competition. *Stunt Car Racer's* datalink mode is a good idea, but it's not very practical, requiring two computers, two monitors and a cable link.

A lot is said of interactive video replacing conventional computer games, but past attempts have highlighted video's many limitations. Video tape is always going to throw out the same visuals with no chance of any deviation. Video disks can juggle the running order of their sounds and images to an extent, but will always be tied down by their limited scope for player interaction. CD ROM is another matter. Using the CD for data, rather than actual images, would allow far more varied possibilities, while you could still have a soundtrack recorded on the disk in conventional format, which would get around the sound limitations of the computer running the game. So far we've heard a lot of promises regarding CD ROM, but so far very little has actually been released on the market. For the near future at least, I can see the current vectored and sprite-based techniques keeping the CD rumours at bay, with 16-bit programmers concentrating more on the vectored side. If things progress at half the speed they have over the last couple of years, you'll be playing some pretty classy race games this time next year.

T.H.

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Adventuring into the Amiga

Adventure started on mainframe computers but now offers an extraordinary range of enjoyment on Amigas and other personal computers. Andy Moss explains how it came about

DRAGON WARS



The man is a hero. He is tall, well over six feet and his long hair hangs damp around his face, which is angular, unshaven and carries more than a few scars. Anybody who looks at this man however is instantly drawn to his eyes. They are sharp, cunning, knowing eyes that give the impression that this man is not deceived easily, he knows everything is not what it seems, yet his eyes possess a look of vast experience. He wears a weatherbeaten leather tunic and breeches, with dusty scuffed boots on his feet, and around his waist is a huge thick leather studded belt that holds the one thing that screams attention from this man. A broadsword that has been honed to the sharpest possible condition with fierce serrated claws along one side, and red discolouration which proves that this sword has seen action.

This man is also a hero. He is rather short, with

"The only problem was how the player could interact with the computer to 'move around' this world. The answer was to devise a two word input system that the computer would recognise and act upon."

close cropped hair and nicotine stained fingers. He wears an old battered raincoat and carries a zip up bag that contains a notebook and pen and a half eaten lunch. He has a look of resigned indifference and seems remarkably similar to TV's Columbo detective. He may look a mess, but this man has

solved many crimes, mostly murders, and has the kind of intelligence that belies his appearance. He is quick to spot a lie, a half truth, anything that might be remotely suspicious.

This woman is also a heroine. She doesn't know it yet, because the incident hasn't happened yet. But it will. She is a typist for a line manager in a manufacturing company, and is looking forward to a weekend of fun and relaxation. What happens is completely the opposite, however, as she will be plunged into a world of international intrigue and



ROCKET RANGER

danger. She will face seemingly insurmountable obstacles along the way but ultimately she will be victorious. Strange, how a typist can turn out to be a world saver. That's Adventure for you.

The three characters are you, the chap across the street who is always tinkering with his car, or the girl behind the counter at the Post Office. The world of adventure has no limitations, just your imagination, a good story, and your Amiga.

Computer adventuring started in the late seventies, when two software engineers bored with churning out mainframe coding day after day entertained themselves by creating a world inside their computer that each could explore at their leisure. Both were keen Tolkien readers and hooked on Lord Of The Rings. So it came as no surprise that their fantasy world was based on a Tolkienian environment. By using lengthy text descriptions, Crowther and Woods created a complete underground world, where twisty paths led to vast caverns, and stone steps led to small chambers, and cracks in the wall led to secret rooms. There were many many locations each one interconnected somehow, and in many of them lay fabulous treasures, all waiting to be found by a brave, resourceful explorer. The only problem was how the player could interact with the computer to 'move around' this world. The answer was to devise a two word input system that the computer would recognise and act upon. This was called the parser, a program that scanned its built-in vocabulary for the correct input and changed the players location accordingly. So now we had a game that described a given location, along with various exits that the player could take using compass directions. On a direction or command being typed in, the computer would then describe the next location or event. Now we had a game of exploration and

discovery, but they went further. They wanted to test each other's intelligence and lateral thinking, so they introduced some devious puzzles into the game. Now you had locked doors with no keys easily to hand, one way rooms, mazes, a slowly fading source of light, treasure too big to get through the door.... and many more. Characters were added: the Troll guarding the now famous chasm bridge, a dragon, a pirate who keeps stealing your treasure, a giant, a golden goose; all designed to keep the player at his wit's end trying to recover all the treasures for maximum points.

By now word about the game with no name was spreading, and copies started to appear on other people's computers, and pretty soon many who had access to a large mainframe were playing ADVENTURE as it was now called or ADVENT or ADV. An end game was written which had the whole cave system start to destruct at a certain point. Soon other versions of Adventure started to spring up, all based around the same system of two word input but using differing scenarios, and puzzles and locations.

With the coming of home computing, it did not take long for one company to introduce Crowther and Woods' original game in its entirety along with a few extra locations. Level 9 made a lot of money using their text compression and advanced parser techniques greatly to enhance Adventure and bring it into everyone's homes on all formats. Soon text adventuring on home computers took off in a big way and spawned many of the companies that are big names today, Level 9, Magnetic Scrolls, Infocom, Sierra, etc. And some that sadly that are no longer with us, Scott Adams, Adventure International and Artic to name two.

"Animated graphic adventures were a way of moving the player into a more realistic environment, by making him not only use his mind but also his dexterity."

As computers gained more memory, the demand for more increasingly complex adventuring grew, and programmers had to find more sophisticated ways to interact with the player. Parser techniques grew at an alarming rate, and the selling point became "look what this parser can do, it can understand 'plant pot plant in plant pot' or 'get vase, put it in the fire and then go south, drop everything and examine door'". Adventuring took on a completely new look, it wasn't just move in a direction, solve puzzle and move again anymore, now you could explore whole landscapes and move at will, encountering puzzles on the way of course, and they needed to be solved, but the puzzle itself did not restrict you going to somewhere else.

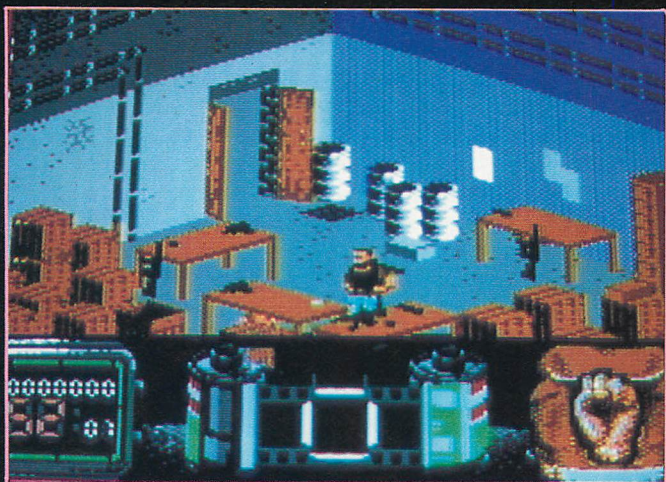
Graphical representations of locations came next. This was a contentious area, as hitherto your imagination was the picture you saw, in your own mind. Many adventure software publishers includ-

continued on page 100

continued from page 99

ing Level 9 and Infocom felt that pictures would ruin the players' enjoyment of the game, surely no picture could adequately describe a scene as well as words? They were to be proven wrong. Computer power increased again, and along with it came enhanced graphic abilities that enabled real artists to paint 'digital' graphics of the highest quality.

Magnetic Scrolls made their name not only on a program that understood complete English, but contained beautiful graphics. However, they could be 'switched off' for the purists who did not want them. This sounded like a reasonable compromise, and so it became law. No graphics in a game, no publisher would touch it. Inevitably, Infocom, that last bastion of text only adventuring followed suit and bowed to commercial pressure.



SPACE QUEST III

Now all kinds of different types of adventuring came. Animated graphic adventures were a way of moving the player into a more realistic environment, by making him not only use his mind but also his dexterity. It seemed that a meeting of arcade and adventure was looming ever closer. Indeed there was a time when 'arcade adventures' were flavour of the month, but these were merely arcade platform games with puzzles thrown in for a bit of fun.

What the graphic revolution really achieved was the birth of real 'role playing' programs, computer versions of Dungeons and Dragons. Now you could create your own character, and watch it learn extra spells, earn money by killing monsters, learn new techniques of fighting etc. This character could be saved and used in other adventures, just as in real life D and D.

Role playing is big bucks, particularly in the USA and many traditional text/graphic adventurers have also tried their hand at these games. It is a different type of game from pure adventure, the graphics are certainly cruder, sacrificing graphic memory for character and monster generation, but you have whole landscapes to cover, visiting towns and villages on the way and finding castles to explore here and there. Usually the storyline is about finding a legendary sword or jewel that will save the World from a tyrants grip, or rescuing a princess or wizard locked away in some far off land. These games are all much more like Tolkiens Lord Of The Rings than anything else, just look at ULTIMA I through to V. from Origin Systems.

Electronic Arts have had the most success with role playing thanks to The Bards Tale series, which became a bench mark for anything else. Its secret was its user friendliness and ease of play yet it became frustratingly difficult to master and this proved to be a winning formula. Interplay (the authors responsible) went on to create more varied role playing scenarios like WASTELAND, a futuristic post-nuclear holocaust story, or more recently DRAGON WARS.

The third adventure style is the totally animated variety pioneered by Sierra. Their system provides the player with a complete 3D perspective view and entails guiding the 'hero' through a variety of scenes in which he can move in or around different objects on screen. From the early days of the KINGS QUEST series which featured rather blocky characters and puny sound through the program being ported directly from IBM, Sierra quickly developed their system to accomodate the Amigas enhanced capabilities. Their latest version features state of the art stereo sound and backdrop graphics which are really something to behold. But even in the early days the storylines were always meaty, and contained enough interesting bits to keep your mind off the not-so-great graphics. LEISURE SUIT LARRY I and II, POLICE QUEST, KINGS QUEST I through to V and SPACE QUEST I II AND III are all musts for your collection.

No adventure feature can fail to mention the one company that really made it happen for everybody. Infocom is legendary. The sheer professionalism evident in all of their releases is a testimony to the hard work and dedication of a talented team of writers and designers. Look at any Infocom product, and it will ooze class. Games such as ZORK I II AND III, TRINITY, LURKING HORROR, WITNESS, SUSPECT, AND STARCROSS, OR SPELLBREAKER are classics and will for me always be timeless. We all used to look forward eagerly to a new Infocom release and were never disappointed, they always turned out the goods. For new aspiring adventurers, you cannot do better than buy an Infocom budget collection into which Activision have bundled a few of the earlier releases. This is also the beauty of adventuring, the actual programs have a long shelf life, so even though the games may have been released some time ago, the stories are still fresh, and, of course, the puzzles are unique to that game, so the challenge is retained.

So you can see how varied computer adventuring has become, no matter what your preference, there will be a style to accomodate it. My personal favourites are ADVENTURE QUEST, LORDS OF TIME (Level 9) ZORK TRILOGY, JOURNEY, LURKING HORROR, BALLYHOO (Infocom) THE PAWN (Magnetic Scrolls) ROCKET RANGER (Cineware) ULTIMA IV (Origin) SPACE QUEST III, LARRY II (Sierra) DUNGEON MASTER (FTL) There is a hero in all of us. Are you the warrior, detective or heroine? Happy adventuring, and remember, when it is nearing midnight, the coffee has gone cold, and you are hopelessly stuck in a room with no doors and the ceiling is slowly coming downwards, you should have saved the game six moves earlier!

A.M.

Amiga Answers

Yuri Large tracks down the tips that keep you on top!

Every week we receive an ever-increasing amount of letters all asking the same thing: "How do I protect my disks from viruses?"

We are all aware of the potential threat, to disks and the data they contain, that is posed by these insidious little programs but, with a little care, the threat can be all but negated.

The most obvious answer is to purchase one of the many "anti-viral" programs that are now available. The quickest and cheapest way is to contact the Public Domain Software companies advertising in AUI, the majority will be able to help you immediately. We recommend you get hold of VirusX 4.0, put it onto your workbench disk and alter the startup-sequence (found in the S directory) to run it, i.e.

```
loadWB  
virusX  
endcli ·nil:
```

As good as virusX is, there are viruses which it cannot catch, in particular BGS 9. This is a parasite/worm virus which appears in the form:

PIRACY IS A DISEASE
TERRORISM IS A TRANSGRESSION
SOFTWARE PIRACY IS A CRIME

THIS IS THE CURE
BGS 9 BUNDESGRENZSCHUTZ SEK-
TION 9
SONDERKOMMANDO 'EDV'

The best protection against BGS, like all viruses is not to catch them. If you do get caught out the PD killer KV (Kill Virus) should be supplied with ARCed versions of VirusX 4.0 or from the PD library supplying VirusX.

Thanks to C. Denning for telling about BGS 9.

Dear Amiga Answers,

I am 61 and have enjoyed many years of video photography for the family. Some years ago I bought an MSX for the purpose of graphics and titling. Now the MSX is no longer popular I have been advised to buy an Amiga with a built in Genlock; I could get an MSX II but these cost around #2000. I have therefore been buying Amiga User International for the last few months and have been pleasantly surprised by what the Amiga can do. BUT, which

Amiga system do I need? Finally, do all Amigas have built in drives?

R.C. Perry, Wigan, Lancs.

Dear R.C. Perry,

Any Amiga can do the job with the appropriate expansions. We suggest you opt for a non-professional system based around an Amiga 500 + 0.5Mb memory expansion and the MiniGen. The A500 will work on a domestic television if you add a modulator - but this plugs into the space normally occupied by the Genlock.

There are several video software packages available for the Amiga - like Deluxe Video, TV*Text and TV*Show. These and others are available from advertisers in this issue - they will be able to give you more specific advice.

Dear Amiga Answers,

I work as a landscape gardener and am looking for a garden design program - either a commercial or Public Domain one. I have an Amiga 500 with 1Mb of RAM and

continued on page 102

continued from page 101

Amiga Answers

a Star LC-10 colour printer and would like a program which makes use of these.

Jon Williams, Romford, Essex.

Dear Jon,

As far as we know there are no packages specifically designed for landscape gardening - if someone knows of one we would love to hear from them. In the meantime you could try a 3D CAD package like Sculpt 3D or Calligari. Both of these would allow you to design objects and display them in 3D space - complete with light sources! Although these are necessarily slow due to their complexity, we feel they may be the best solution to your unusual problem.

Dear Amiga Answers,

I was particularly interested in the PD AmigaDOS replacement project outlined in ARPing On (AUI November 1989). When I attempted to obtain a copy the Softville PD service sent version 1.03 on Fish 123 not the completed version mentioned in the article. Can you help?

Tim Briggs, Bexleyheath, Kent.

Dear Tim,

Our copy of ARP 1.3 came directly from MicroSmiths in the US. However 17 Bit Software (0924-366982) have the complete version with full auto-installation.

Dear Amiga Answers,

I think you should name your magazine Amiga GURU International because we depend on you totally for the answers. I have recently upgraded from my C64 to the Amiga but am finding the machine very confusing. For instance, some of the keys seem to be transposed SOME of the time. I am using Mavis Beacon Teaches Typing to learn to type but it insists I keep hitting the wrong keys! Protext on the other hand prints the right keys - what is going on?

Bigger problem: I would like to use the Amiga to get onto music but all of the adverts seem very confusing. I see names like Jammers, Synths, Sequencers and Samplers but what do they all mean and what is the most basic setup I can use?

John McKillop, Glasgow.

Dear John,

We are always glad to be of help - but we remain fond of our name . . . The keyboard problem you have is sadly all too common. It is probably due to the either the software you are using - or, more likely, the startup-sequence on your boot disk; that is the first disk put into the computer. In the startup-sequence there is a command: `system/setmap gb ; activate (/*)` on keypad

It appears this command is either missing or incorrect. For instance if you have a foreign version of Workbench it could read: `system/setmap us`

Which installs an American keyboard. What you must do is fix this command in the startup-sequence using ED, then copy the GB file from a UK Workbench disk to the DEVS/KEYMAPS directory. If you have two drives put the offending disk in DF0: and do this from a Shell: `copy df1:devs/keymaps/gb to sys:devs/keymaps/eds:startup-sequence`. To leave ED use the command `Esc X Return`. That is the Escape key, the letter X, then Return. This should fix the problem.

Regarding your other problem, music is a vast area which we cover regularly and have no room to explain in detail here. To get started all you really need is a stand-alone music package like Sonix or SoundTracker. If you want to use external hardware you will need, at least, a MIDI (Musical Instrument Digital Interface) interface and a MIDI compatible synthesizer. For most purposes the Amiga can produce extremely good sound at low cost.

Dear Amiga Answers,

I hope you can help me with a problem,

I own two systems as listed below:

Amstrad PC
Logitech ScanMan
Paintshow Plus
and
Commdore Amiga A500
Deluxe Paint II
Photon Paint

I have just bought a Hewlet Packard Paint-Jet colour printer and I would like to scan images and paint them in colour. Is there any way I can transfer IFF files between the PC and Amiga, I know the easiest thing to do is buy a scanner compatible with the Amiga but I am hoping there is a simpler - and cheaper - way.

B.E.Kidd.

Dear B.E. Kidd,

As far as we know, at the moment there is no software for the PC to convert to IFF format picture files. This is a fault of the PC programmers since the IFF standard is powerful enough to support all current small computer graphics. There is light at the end of the tunnel, a colleague of ours is writing just such a utility for the Amiga to convert between most PC formats and IFF. Expect to see it arrive soon - in the meantime we cannot offer any more help, sorry.

Dear Amiga Answers,

I have several programs which I would like to add to my Workbench disk so they start when the machine boots - they currently reside in the C directory. Also I have removed some programs from the disk and now I get the message 'Pure bit not set'. This repeats several times before the Workbench starts - what does it all mean?

Derek Tweedie, BFPO Ships.

Dear Derek,

Adding programs to the Startup-Sequence is as simple as editing the file with ED and adding the commands. However, some commands may require running with either RUN or the PD program RunBack - to generate an "asynchronous" process. If this is not done correctly, the CLI will refuse to go away! (VirusX 4.0 can be started without run though).

The Pure bit relates to the new commands added in release 1.3 of Workbench. If a program is "pure" code it can be made resident - the Pure bit indicates this - and run in the multi-tasking environment several times with a single copy in RAM. Old commands are NOT pure and must not be made resident - this is causing the warning - you are trying to make old commands resident. You must never force the pure bit of software unless you know the code is pure. Non-pure programs can cause disastrous problems.

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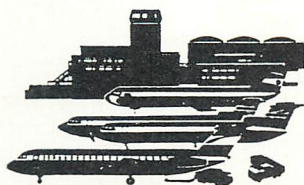
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QUAD

More Quick and Dirty tricks from Giulio Zicchi

This month we are going to take a look at dual playfields. The Amiga's screen display is made up of at least one bitplane, which is simply a chunk of RAM from the computer's memory displayed on your monitor (or television) screen. A bitplane is a (usually) contiguous piece of memory which is configured as WIDTH bytes wide by HEIGHT lines high and so this is the formula by which we can calculate the memory required for any given display.

Given that one bit of a byte is seen as one pixel on the display screen, it follows that we must divide the number of horizontal pixels by eight to arrive at the byte width.

For a 320*200 screen we would need to allocate 8000 ((320/8)*200) bytes of memory. However, this would allow only two colours - bits on or bits off - and so in practice we have to allocate more than one plane in order to increase the colour choice available.

Amiga displays, then, possess depth as well as width and height.

Add to this information the fact that all memory used for display and sonic

purposes, including copper lists, must reside in the lower 512k of memory (later 1 meg ACS machines notwithstanding) and it should come as no surprise that a 320*200*4 (16 colour) display is by far the most popular display mode used for games on the Amiga. This mode provides the best compromise between memory and colour choice.

The Amiga hardware supports up to six display planes, all of which are required for HAM and Extra Halfbrite (sic) modes and a combination of which are required for Dual Playfield mode.

Dual playfields are two independent displays laid one on top of the other. Each one may be up to three planes deep and so a limit of eight colours per playfield is imposed although colour zero of the top playfield is actually transparent. This is quite a memory-hungry display mode and therefore it is not unusual to see one playfield restricted in size in games that utilise it.

This example configures all six planes even though it does not use all the colours available. I have done this in order to illustrate the use of the bitplane

pointers. When using dual playfields, the actual planes are configured differently from a normal display, that is to say that the pointers are not used sequentially. A normal display would use the plane pointers at \$DFF0E0, \$DFF0E4 etc. where these addresses are long word pointers to the actual display memory. Either of the displays used in dual playfield mode uses alternate registers - see the copper list in the accompanying program listing for clarification of this.

Several other hardware registers are important in this mode and I will make a few observations regarding these registers, although the Hardware Reference Manual is an essential purchase if you wish to program the Amiga at assembler level with games in mind.

Firstly, to enable dual playfield mode, it is necessary to set bit 10 in register \$DFF100 - BPLCON0. Bits 12-14 of this register set the number of planes required. Playfield priority is selected by bit 6 of BPLCON2 at \$DFF104 and this register also controls sprite priority with respect to each plane of display memory. In this example, the mouse pointer can be seen above the top playfield but below the bottom one.

The best way to get to grips with the Amiga is by experimentation so do try altering different parts of the program after you have typed it in and saved it to disk!

All of the articles in this series were written using HiSoft's Genam2 assembler for the Amiga.

```
opt      c-,d+

incdir dh0:include/      change 'dh0:' to your own include dir
include exec/exec_lib.i
include exec/memory.i
include hardware/custom.i
include graphics/graphics_lib.i

;-----
;               Constant definitions
;-----

CUSTOM          equ      $DFF000          base of Custom chips

PF1_WIDTH        equ      40              playfield 1 byte width
PF1_HEIGHT       equ      200             lines high
PF1_DEPTH        equ      3              planes deep
PF1_PLANESIZE    equ      PF1_WIDTH*PF1_HEIGHT
PF1_SIZEOF       equ      PF1_PLANESIZE*PF1_DEPTH

PF2_WIDTH        equ      40              playfield 2 byte width
PF2_HEIGHT       equ      200             lines high
PF2_DEPTH        equ      3              planes deep
PF2_PLANESIZE    equ      PF2_WIDTH*PF2_HEIGHT
PF2_SIZEOF       equ      PF2_PLANESIZE*PF2_DEPTH

MEM_REQUIRED     equ      PF1_SIZEOF+PF2_SIZEOF

;-----
```

continued on page 110

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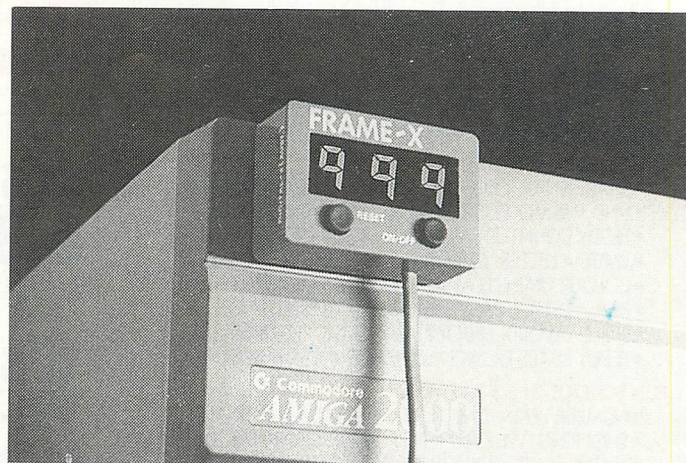
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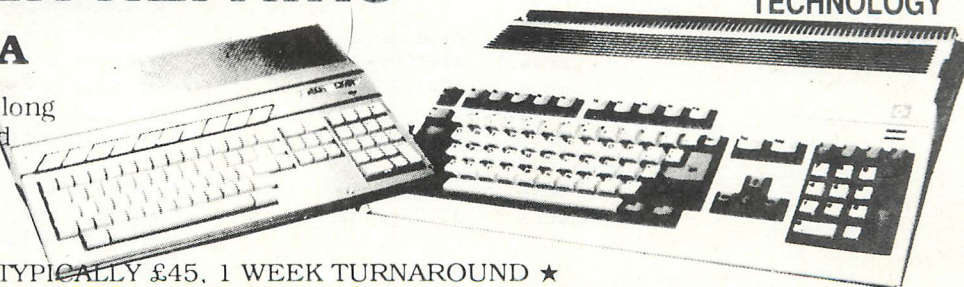
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continued from page 104

```

Main
    lea    GfxLib(pc),a1          library to open
    moveq  #$00,d0               any version
    Callexec    OpenLibrary      attempt open
    move.l  d0,_GfxBase          store pointer
    beq     Nolib_exit           null pointer = no library

    move.l  #MEM_REQUIRED,d0      byte size
    move.l  #MEMF_CHIP+MEMF_CLEAR,d1  type of memory required
    Callexec    AllocMem
    move.l  d0,MemBase           store pointer
    beq     Nomem_exit           didn't get memory

    bsr     Plane_addresses      insert plane addresses
    bsr     Draw_Squares         make pattern in bottom playfield
    bsr     Fill_Top_PF         make window in top playfield

    move.l  _GfxBase,a0          library base
    move.l  50(a0),OldCop        store system copper list
    move.l  #NewCop,50(a0)       insert our copper list

Wait
    Callgraf    WaitTOF          wait for raster
    bsr     Scroll_Playfield     pixel scroll bottom playfield
    btst     #6,$bfe001         wait for left mouse button
    bne      Wait
    move.l  _GfxBase,a0          get library base
    move.l  OldCop,50(a0)        restore old copper

DeAlloc
    move.l  MemBase,a1          de-allocate memory
    move.l  #MEM_REQUIRED,d0
    Callexec    FreeMem

Nomem_exit
    move.l  _GfxBase,a1          close graphics library
    Callexec    CloseLibrary

Nolib_exit
    rts                        exit to CLI

;-----

Plane_addresses
    move.l  Membase,d0          bottom playfield
    move.l  d0,d3               preserve
    lea     Top_Planes,a0        ptr to label in copper list
    move.l  #PF1_PLANESIZE,d1    size of one plane
    bsr     PA_main              insert addresses
    move.l  d3,d0               retrieve ptr
    add.l   #PF1_SIZEOF,d0       increment to top playfield
    move.l  d0,PF2_Base          store top playfield address
    lea     Bottom_Planes,a0     ptr to label in copper list
    move.l  #PF2_PLANESIZE,d1

PA_main
    moveq   #02,d2              for 3 planes (both playfields)

PA_loop
    move.w  d0,6(a0)            insert low word of address
    swap   d0
    move.w  d0,2(a0)            insert high word of address
    swap   d0
    add.l   d1,d0               add plane offset
    lea     8(a0),a0            increment past plane ptrs
    dbra   d2,PA_loop           for all planes
    rts

;-----

Draw_Squares
    move.l  Membase,a0          ptr to bottom playfield
    move.l  #fff00ff0,d0        pattern to draw
    move.w  #24,d2              do block 25 times

DS_outer
    move.w  #8*10-1,d3          ten longwords * 8 lines

DS_inner
    move.l  d0,(a0)+            write into memory
    dbra   d3,DS_inner          for 8 lines
    not.l   d0                  invert pattern for chequered effect
    dbra   d2,DS_outer         for the whole playfield
    rts

```

continued on page 111


```

;-----
Fill_Top_PF
    move.l    PF2_Base,a0          ptr to top playfield
    move.l    a0,a1               copy ptr
    moveq     #-1,d0              fill memory pattern
    move.w    #(PF2_PLANESIZE/4)-1,d2    one plane
FT_fill_loop
    move.l    d0,(a0)+            fill memory
    dbra      d2,FT_fill_loop      for whole plane
    lea       PF1_WIDTH*50+10(a1),a1    increment to midscreen
    moveq     #$00,d0             clear memory
    moveq     #100,d1             lines to clear
FT_clear_outer
    moveq     #$04,d2             longwords to clear
FT_clear_inner
    move.l    d0,(a1)+            write into memory
    dbra      d2,FT_clear_inner
    lea       20(a1),a1           add modulo
    dbra      d1,FT_clear_outer
    rts
;-----
Scroll_Playfield
    lea       NewCop,a0           ptr to copper list
    move.w    Scroll,d0           scroll value
    addi.w    #$01,d0             increment
    andi.w    #$0f,d0            mask off un-needed bits
    move.w    d0,Scroll           replace
    move.w    d0,6(a0)            and place into relevant register
    rts
;-----
Gfxlib      dc.b    "graphics.library",0
            even
_GfxBase    dc.l    0
MemBase     dc.l    0
PF2_Base    dc.l    0
OldCop      dc.l    0
Scroll      dc.w    0
;-----
SECTION      ChipStuff,DATA_C
NewCop
    dc.w      $0100,$6600,$0102,$0000,$0104,$0060
    dc.w      $0108,$0000,$010A,$0000
    dc.w      $0092,$0038,$0094,$00D0
    dc.w      $008E,$2C81,$0090,$F4C0.
Top_Planes
    dc.w      $00E0,$0000,$00E2,$0000
    dc.w      $00E8,$0000,$00EA,$0000
    dc.w      $00F0,$0000,$00F2,$0000
Bottom_Planes
    dc.w      $00E4,$0000,$00E6,$0000
    dc.w      $00EC,$0000,$00EE,$0000
    dc.w      $00F4,$0000,$00F6,$0000

    dc.w      $0180,$0885,$0182,$0026
    dc.w      $0184,$0440,$0186,$0A66
    dc.w      $0188,$06AA,$018A,$0056
    dc.w      $018C,$0340,$018E,$0DDD

    dc.w      $0190,$0000,$0192,$0500
    dc.w      $0194,$0600,$0196,$0A33
    dc.w      $0198,$0EAA,$019A,$0004
    dc.w      $019C,$004B,$019E,$0FEF

    dc.w      $FFFF,$FFFF
;-----

```


Advanced System Programmer's Guide for the Amiga

Co-authored by Bruno Jennrich, Wolf-Gideon Bleak and Peter Schultz
(Abacus/Data-Becker £29.95)

Over the last few years Abacus/Data-Becker have become one of the leading publishers of Amiga Books. Most of their offerings provide an almost conversational style alternative to the material found in the heavyweight official Amiga reference manuals and this, coupled with the fact that they always contain plenty of runnable program examples, makes a welcome change to the official literature.

The Advanced System Programmer's Guide for the Amiga is the latest offering and its co-authored by Bruno Jennrich, Wolf-Gideon Bleak and Peter Schultz. Their aim? Basically to provide the serious Amiga programmer with an in-depth tutorial and reference guide.

The first two chapters provide brief notes on programming style etc., and these are followed by a chapter which explains the differences between CLI and WorkBench environments. The notes on parameter passing via the CLI includes some interesting example routines but by far the most interesting sections are those which deal with the

WorkBench's '.info' file layout and the use of the icon library routines.

The Amiga's devices, which are dealt with in chapter 4, are thoroughly covered: Plenty of introductory notes on device initialization, IOREquests and ReplyPorts etc., are coupled with the development of some good generalized device-support functions. Following this comes details of the various Amiga devices themselves with the parallel and serial devices being dealt with first.

The chapter on the Amiga's library functions is intended to be a reference section and provides similar information to the function summaries of Addison Wesley's Includes and Autodocs manual. Its up-to-date for version 1.3 of the system software and covers the functions, their purpose, and details of the parameters required.

Other chapters provide a goldmine for the serious reader offering help with such things as font creation, font character data, keymaps, the Preferences structure, and a discussion on creating specialized printer drivers.

All of the example routines and

programs are written in C and although the book contains a lot of hi-tech material it is quite easy to read. Bleak, Jennrich and Schultz, who also co-authored the 'Amiga C for Advanced Programmers', are competent Amiga programmers who (even though they're not adverse to taking the occasional programming shortcuts) have provided a lot of useful information in this volume. The result - not a bad book by any means. For the professional programmer, or even the very serious enthusiast, it will not however replace the official RKM documentation. What it does do though, is provide alternative descriptions within a more accessible framework. Addison Wesley's official ROM Kernel Manuals are very good, but it must be said that they've often regarded as rather daunting. This Abacus/Data-Becker alternative provides many use-able examples and this makes a lot of the complex topics just that bit more understandable - that fact alone makes this new offering a very useful book indeed.

P.A.O.

Industrial Robotics (Machine Vision & Artificial Intelligence)

Edited by Ken Stonecipher
(Howard W. Sams & Co. £28.50/\$39.95)

Most of us know of, and some have seen, the factories where computer controlled robot arms paint, weld, carve, spray and do a thousand and one other jobs formerly done by man. But these instruments, clever as they are, are almost non-starters to what robots may eventually become.

In 'Industrial Robotics' seven experts give us a glimpse into the future and show how computers aided by Artificial Intelligence (AI) will transform our society and workplaces into hitherto undreamed of mechanical wonders.

The prime constituent is AI for it is this that will allow robots, or the computers that will control them, to 'think'.

Research into AI has been going on for at least thirty years with almost every university, business and research laboratory now funding in-depth AI programs of one kind or another. So far, although there has been a great deal of progress, a computer that can match the thought processes of the human brain has yet to emerge.

As engineer/scientist, Thomas Hancock - who has worked for both the Macdonell-Douglas Astronautics Company and NASA, for whom he helped

develop global computing systems for the Deep Space Network - explains, 'AI is a subject that is simple to embrace but complicated to investigate and fully understand.' 'Industrial Robotics' goes a long way towards helping Joe Public make sense of it.

The principal obstacle is how to teach computers heuristics. Heuristics? It means problem solving through the use of rules and definitions, or the rule-of-thumb or trial-and-error method.

The sort of thing the human brain does instinctively but for which a computer has to have a program. Heuristics is 'probably the closest that researchers have yet come to modelling human thinking processes.'

Most of the AI programs to date have been structured in a BASIC-like language but it has not proved very satisfactory. For example, one automatic translation program used to produce an English-readable version of a Russian document produced a 50% to 60% readability score. Unfortunately the rest was translated either phonetically, if it found the word was untranslatable, or came out scrambled. Not much help to anyone.

Now most AI programmers are turning to LISP (list processing language). LISP utilizes symbols rather than numbers so its speed and ability to crunch information in a symbolic format make it one of the best languages for use in AI applications.

The future for computer controlled AI robotics is the stuff of which science fiction is made. Not only in space but also in other areas. Domestic, farming, medical, as well as factory robots will be able to decide for themselves which is the best way of working, automated aircraft that will not need a pilot, (unless a critical situation occurs), robot surgeons, the list is endless.

To quote Hancock again, 'In 20 years (we) may be hard put to find an area of life which is not influenced by AI applications. If civilization is fortunate, many of the discoveries of tomorrow will be made by AI machines. They may educate our children, diagnose and cure our diseases. The applications of AI are boundless, just as in the beginning of aviation. Today we learn to fly; tomorrow we will make flight work for us'.

If you read 'Industrial Robotics' you will have some idea of what he means.

D.M.

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At Harwoods we've yet again improved our Great Value Amiga Offers with the launch of our **LATEST & GREATEST EVER POWERPLAY PACKS** with **EVEN MORE SOFTWARE**, *plus...* our brand new **PACK 5!** Just look at the **11 NEW SIZZLING SOFTWARE TITLES** we're giving away **ABSOLUTELY FREE** in our new games packs. Remember, though, you can only get all this when you buy your Amiga from Harwoods.

ALL OUR PACKS CONTAIN AMIGAS WITH THE FOLLOWING STANDARD FEATURES:-

- | | |
|--|---|
| <input type="checkbox"/> 512K RAM | <input type="checkbox"/> Mouse |
| <input type="checkbox"/> 1Mb Disk Drive | <input type="checkbox"/> 3 Operation Manuals |
| <input type="checkbox"/> 4096 Colours | <input type="checkbox"/> Workbench 1.3 |
| <input type="checkbox"/> Multi-Tasking | <input type="checkbox"/> System Disks |
| <input type="checkbox"/> Built-in Speech Synthesis | <input type="checkbox"/> Kickstart 1.3 |
| | <input type="checkbox"/> Built-in All Connecting Cables |

ALL OUR PRICES INCLUDE VAT AND STANDARD DELIVERY SERVICE

Amiga POWERPLAY PACKS

Amiga

PACK 1
PACK 1
PACK 1
PACK 1
PACK 1

THE COMPLETE PACK FOR THE GAMES ENTHUSIAST AVAILABLE RIGHT NOW!

Our **ALL NEW Amiga Powerplay Pack 1** now includes some great up to the minute software and extras, just look at the savings you're going to make!!!

- | | | | |
|---------------------|--------------------|-------------------|--|
| Amiga A500 Computer | → Running Man | → Tetris | Microswitched Joystick |
| → Batman the Movie | → Nebulus | → Phobia | Tailored Amiga Dust Cover |
| → New Zealand Story | → Menace | → Voyager | Tutorial Disk |
| → F18 Interceptor | → Chessmaster 2000 | → Archipelagos | TV Modulator - (With Packs 1 & 5 ONLY) |
| → Commando | → Trivial Pursuit | → ??? Mystery ??? | Mouse Mat |

SEE WHAT WE MEAN ABOUT COMPLETE!

You won't need to buy any more games for ages and you'll be able to start using your Amiga the moment it's unboxed!

£399

OR SPREAD THE COST WITH OUR FINANCE FACILITIES

DEALIN' DIEGO YOUR AMIGA AMIGO ALWAYS SHOOTIN' OUT THE BEST DEALS!



DIEGO'S EXTRA SPECIAL DEAL!

Genuine A501 Ram Pack... Strictly Limited Offer to First 200 Customers!

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Amiga

HARWOODS ALL NEW COMPLETE STUDENTS PACK

Amiga A500
Publishers Choice (DTP- Includes Kindwords V.2)
Midi Master I/Face
Dr. T's Midi Rec. Studio
BBC Basic Emulator
Maxiplan 500 S/Sheet
Superbase Personal D/Base

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PLUS 14 GREAT GAMES TOO!!!
(See Pack 1 for details of titles)

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Amiga

PACK 2

Containing the Super Powerplay Pack 1, AND a Philips Stereo CM 8833 Monitor PLUS a Free Tailored Monitor Dust Cover...

See Those Games for Only...

£619

Amiga

PACK 3
PACK 3
PACK 3
PACK 3
PACK 3

NEW AMIGA AND COLOUR PRINTER PACK

Take our Powerplay Pack 2 and add Star's fantastic LC10 COLOUR PRINTER, to give you the ultimate colour home entertainment computer system!!!
Or, if you prefer an alternative printer from within our range, just deduct £209.95 and add the price of the printer you require. (Any printer can be chosen)

Superb Value...

£819

Amiga

PACK 4
PACK 4
PACK 4
PACK 4
PACK 4

NEW POWERPRO PACK 4 CONSISTS OF...

Amiga A500, Star LC10 Colour Printer
Philips CM 8833 Stereo Colour Monitor
"Protext" Version 4.2 Word Processor
"Superbase II" Database
"Maxiplan 500" Spreadsheet
Ten 3.5" Blank Disks & Library Case
Computer, Monitor & Printer
Tailored Dust Covers
Mouse Mat

We Mean Business! At Only...

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24 HO

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Remember after you've purchased from Harwoods we'll still be here...

12 MONTH WARRANTY: If goods prove to be faulty within 30 days of purchase they will be replaced with a NEW UNIT. For the remainder of the guarantee period, all warranty repairs will be made FREE OF CHARGE!

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FULL TESTING PROCEDURE: All computers are tested prior to despatch, and all items are supplied with mains plug and leads as required.

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PHILIPS CM 8833 STEREO

Full 14" Stereo High Resolution Colour Monitor

- ❑ SCART Euro-connector fitted as standard
- ❑ RGB/Al, TTL, Comp. Video & stereo audio inputs
- ❑ Can also be used as a TV with tuner or VCR
- ❑ Features fold down tilt-stand
- ❑ Twin Speakers
- ❑ FREE lead for computer of your choice
- ❑ ONLY FROM HARWOODS...12 Month replacement warranty for major faults

All this and a Free Tailored Dust Cover... **£249**

COMMODORE 1084 S

Full 14" Stereo High Resolution Colour Monitor

- ❑ RGB/Al, TTL, Composite Video & Audio Inputs
- ❑ Can also be used as a TV with a tuner or VCR
- ❑ Features fold down tilt stand
- ❑ Twin Speakers
- ❑ Supplied with cables for A500, CGA PC, C16-64-128

With Free Tailored Dust Cover... **£259**

GRAPHICS HARDWARE

DIGIVIEW GOLD 4.0

NEW VERSION 4.0 enhanced software

Digitises static images in FULL COLOUR and all resolutions supported (memory permitting). Creates IFF and HAM files. Uses B&W or colour with B&W mode video cameras. **£139.95**

VIDEO TO RGB SPLITTER

Takes standard video signal, separates red green and blue. Enables standard video recorder or colour camera to digitise in colour with Digiview Gold (requires clear picture pause with recorder). **£109.95**

RENDALE GENLOCKS

8802 SEMI-PROFESSIONAL **£189.95**
▲ NEW LOW PRICE ▲
8806 PROFESSIONAL **£749.00**

SUPER PIC

Real time frame grabber and Genlock. Instant colour frame grabber from moving video. Capture superb digitised video images in a range of resolutions from standard composite video source such as domestic video recorder or video camera in 50th of a second. Includes Genlock to overlay Amiga graphics onto moving video. Super Price... **£539.95**

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Same as the SUPER PIC programme but without the Genlock. Great Value... **£439.95**

MINIGEN GENLOCK

Entry level Genlock for mixing moving video picture with computer graphics. Ideal for titling, no monitor required. **£113.85**

HITACHI VIDEO CAMERA
Mono, 650 scan lines. **£249.95**

STORAGE DEVICES

HARD DRIVES

COMMODORE A590 20Mb HARD DISK DRIVE FOR AMIGA A500, WITH FREE 0.5 Mb MEMORY

Commodore's own hard drive for the A500

- ❑ Autoboot with Kickstart 1.3
- ❑ Sockets for up to 2Mb RAM expansion
- ❑ Can be expanded in 512K blocks
- ❑ DMA access
- ❑ External SCSI port
- ❑ SUPPLIED WITH FREE 0.5Mb MEMORY EXPANSION (As detailed below "Hard Disk Upgrade")

SUPER LOW PRICE ONLY...£399.00

A590 HARD DISK WITH 2Mb MEMORY

- ❑ Expansion fitted and Ready To Go!

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- ❑ Onboard, fit up to 4, in stages, giving 2Mb total
- ❑ Up to 3Mb when fitted with A501

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40Mb VORTEX HARD DRIVE FOR BOTH

AMIGA A500 AND AMIGA A1000

- ❑ For both A500 and A1000 as supplied
- ❑ Autoboots on ANY Amiga

GREAT VALUE AT ONLY...£499.00

FLOPPY DRIVES

EXTERNAL FLOPPY DISK DRIVES

The drives listed below have the following features...

- ❑ Enable/Disable switch
- ❑ Throughport
- ❑ LED Access light, super quiet
- ❑ Suitable for A500, A1000, A2000

CUMANA CAX 354 3.5" SECOND DRIVE

- ❑ 25mm Super slimline 3.5" drive

A REAL BARGAIN AT ONLY...£89.95

AMIGA CAX 1000S 5.25" SECOND DRIVE

- ❑ Amiga DOS and MS DOS compatible

SAVE MORE THAN EVER...£129.95

HARWOODS SUPERSLIM 3.5" SECOND DRIVE

- ❑ Extra storage and great value too!

'SUPERLIM PRICE' ONLY...£69.95

ACCESSORIES

COMMODORE

A501 RAM PACK *Soft Disc's Special* **£119.95**

GENUINE CBM ram pack with real time battery backed clock. This add-on DOES NOT invalidate Commodore's warranty.

A520 TV MODULATOR **£19.95**

QUALITY MICROSWITCHED MOUSE **£34.95**

FLOPPY DISKETTES

QUALITY CERTIFIED 3.5" BULK DISKS (supplied with labels)

Ten, with library case **£9.49**

Ten, uncased **£8.49**

Eighty, uncased **£49.95**

Hundred, uncased **£59.95**

Eighty with LOCKABLE storage case **£54.95**

PHONE FOR LARGER QUANTITY DISCOUNTS!

PRINTERS

All printers in our range are Dot-Matrix and include the following features...

Standard Centronics parallel port for direct connection to Amiga, PC's, ST etc. and come with... FREE CONNECTOR CABLES!

Free Tailored Dust Cover With Every Star Printer Bought!

STAR LC10 - 120/25 cps

Our most popular Mono Dot-Matrix printer and at a super low price **£169.95**

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Brand new superbast MkII version of the ever popular LC10 printer.

- ❑ Multiple font options from front panel
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Colour version of the LC10...

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- ❑ Our most popular colour printer! **£209.95**

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24 Pin version of the Star LC Series with

- ❑ Exceptional letter print quality **£249.95**

STAR XB24 10 COLOUR - 240/80 cps

Very fast LQ 24 Pin Colour

- ❑ Includes FREE on-site maintenance for a FULL 12 MONTHS! **£479.95**

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The MOST competitive 24 Pin Colour Printer available Today!!! **£349.95**

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- ❑ Compatible with both Amiga and Commodore 64/128 Computers **£249.95**

Characters Per Second speeds quoted are Draft/LQ at 10cps

All our Star printers are genuine UK spec. which are specifically manufactured for sale in the UK only. European spec. versions are being unofficially imported against the wishes of Star Micronics UK. These printers DO NOT carry a Star UK warranty, and WILL NOT BE serviced by them should the need arise. UK specification printers may be recognised by their 3-Pin UK type moulded plug.

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Complete solution for DTP needs contains... Kind Words V2 WP Package, Pagesetter V1.2 with Artists Choice clip art and Headliner Font Pack

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Advanced Midi Amiga Sampler, High Quality Sound Sampler & Midi Interface including all necessary software

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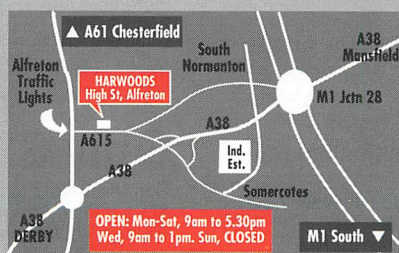


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This image was photographed directly from an Amiga 1080 Monitor and shows the new 4096 color Dynamic HiRes Mode available with Digi-View 4.0.

4096 Colors in High Resolution

Digi-View Gold, the best video digitizer for the Amiga, just got one hell of a lot better. With the all new Digi-View 4.0 software you can do the one thing most people thought was impossible—digitize and display all 4096 colors in high resolution! We call this revolutionary new graphics mode Dynamic HiRes and you will have to see it on your own screen to believe it. But that's just the start of what makes Digi-View 4.0 a breakthrough. Other new features include: Dynamic HAM (fringe free HAM), Noise Reduction (for the sharpest images ever), ARexx support, super bitmap digitizing (directly into Digi-Paint 3), 24 bit color support, 68020 compatibility and dozens of other new features making Digi-View Gold the hottest Amiga graphics product ever.

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Digi-View Gold is available now at your local Amiga dealer.
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*Requires standard gender changer for use with Amiga 1000. Digi-View Gold, Digi-Paint 3 and Video Toaster are trademarks of NewTek, Inc. Give a man a VCR and he can watch reruns, give him a Video Toaster and he can make his own!